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WHEN WILL GOVERNMENTS REGULATE NONPOINT SOURCE POLLUTION? A COMPARATIVE PERSPECTIVE

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Abstract: Although the U.S. Clean Water Act does not directly regulate nonpoint source water pollution, it does provide mechanisms that prompt states to address nonpoint source water quality problems within their borders. This prompt, however, merely raises the next question: when, or under what political conditions, will states actually do so? Although individual states within the United States provide many bases for comparison, this Article examines the issue of prompting nonpoint source regulation from an international comparative perspective, focusing on the nascent efforts of the Australian states of Victoria and Queensland to address nonpoint source pollution and the potential lessons from the various U.S. states' histories of nonpoint source regulation. Specifically, this Article's examination of nonpoint source management in various U.S. states suggests: (1) there will be little political will to regulate water quality until water quality problems become obvious to the relevant populace; (2) agricultural sources of nonpoint source pollution generally create the most significant political resistance to regulation; but (3) important countervailing interests in water quality—such as water-based tourism and recreational interests, drinking water quality, and culturally important fisheries—can sometimes overcome at least some political resistance to nonpoint source regulation. Translating these lessons to Australia, open source water supply catchments in Victoria and agriculturally induced water quality impacts to the Great Barrier Reef in Queensland may present the best political opportunities to create regulatory requirements for upstream agricultural nonpoint sources. Still, institutional reform and increased political will at both the Australian state and federal levels are needed. In particular, the Australian Commonwealth Government must become the leader in improving water quality for the Great Barrier Reef.

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INTRODUCTION

In the United States, nonpoint source pollution is well-recognized to be one of the last major barriers to achieving state and national water quality goals.¹ Despite this, in 1972, Congress made a conscious decision to leave regulation of nonpoint source pollution to the states when it comprehensively amended the Federal Water Pollution Control Act.² The result has been a *de facto* fifty-state experiment in regulation—or, often, non-regulation—of this type of water pollution, with different states pursuing (or not pursuing) regulation of nonpoint sources in response to local and regional drivers.³

The United States now has over forty years of experience with fairly explicit state control over nonpoint source pollution.⁴ State and regional variations in addressing nonpoint source pollution can be extreme, but one pattern is discernible: States and regions always need a significant water quality interest with political salience before they will adopt actual nonpoint source regulation in the form of enforceable requirements. For example, agriculture is often a locally and regionally significant source of water pollution that is frequently exempt from Clean Water Act (CWA) regulations.⁵ Generally, in politically powerful agricultural states, there needs to be a countervailing and prominent water quality concern to motivate states to regulate nonpoint source pollution in general and agricultural nonpoint source pollution in particular.⁶ In the Pacific Northwest states, protection of culturally, economically, and recreationally important salmon has often prompted strong nonpoint source protection.⁷ In

¹ See *Nonpoint Source Pollution: The Nation's Largest Water Quality Problem*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/nps/outreach/point1.cfm> (last updated Sept. 15, 2014), archived at <http://perma.cc/APQ3-N2AZ>. Nonpoint source pollution is water pollution resulting from diffuse sources not directly subject to human control, such as runoff from disturbed lands or parking lots. *Id.*

² See S. REP. NO. 92-414 (1971), as reprinted in 1972 U.S.C.C.A.N. 3668, 3705.

³ See Colin Crawford, *Wastewater Resources: Rethinking Centralized Wastewater Treatment Systems, Land Use Planning and Water Conservation*, 43 URB. LAW. 155, 166 (2011).

⁴ See Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring A Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21, 121 (2002).

⁵ See J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 ECOLOGY L.Q. 263, 293–94, 331 (2000).

⁶ See *id.* (“Although the CWA defines ‘pollutant’ to include ‘agricultural waste discharged into water,’ other provisions of the statute put discharges of agricultural wastewater, stormwater, and fill material largely beyond regulatory reach.”) (quoting 33 U.S.C. § 1311(a) (2012)); *Nonpoint Source Pollution: The Nation's Largest Water Quality Problem*, *supra* note 1.

⁷ See ENVTL. LAW INST., PUTTING THE PIECES TOGETHER: STATE NONPOINT SOURCE ENFORCEABLE MECHANISMS IN CONTEXT 89 (2000), available at <http://www.eli.org/sites/default/files/eli-pubs/d10-05.pdf>, archived at <http://perma.cc/RDP5-MYQR>; OR. DEP'T OF ENVTL. QUALITY, OREGON NONPOINT SOURCE CONTROL PROGRAM PLAN, at i (2000) [hereinafter OR. DEP'T OF ENVTL. QUALITY, OREGON NONPOINT SOURCE PLAN], available at <http://www.deq.state.or.us/wq/>

other states, nitrate contamination of groundwater—which causes “blue baby syndrome”⁸—has motivated more stringent regulation.⁹ In the Chesapeake Bay states, concern from both Congress and the U.S. Environmental Protection Agency (EPA) about the increasingly degraded condition of the Bay has prompted increased management of nonpoint sources.¹⁰ In contrast, the Gulf of Mexico’s long-term “dead zone” has yet to generate either state or federal action to address the nonpoint source nutrient pollution that contributes to the problem.¹¹

Although the continent of Australia is roughly the same size geographically as the United States, and although both countries were settled by Europeans, Australia has a far smaller population, is more geographically isolated, is much drier overall, and has markedly fewer freshwater water resources.¹² As

nonpoint/docs/plan/plan.pdf, archived at <http://perma.cc/9URF-93QG> (noting the importance of water quality to salmon and steelhead).

⁸ *Water-Related Diseases*, WORLD HEALTH ORG., http://www.who.int/water_sanitation_health/diseases/methaemoglob/en/ (last visited Nov. 11, 2014), archived at <http://perma.cc/6NBP-G53K> (Methaemoglobinemia, commonly known as “blue baby syndrome,” is caused by the “decreased ability of blood to carry vital oxygen around the body . . .” and “[o]ne of the most common causes is nitrate in drinking water.”).

⁹ See SUSAN DONALDSON & MELODY HEFNER, NONPOINT EDUCATION FOR MUNICIPAL OFFICIALS NEVADA, UNIV. OF NEVADA, RENO, NONPOINT SOURCE WATER POLLUTION 3 (2004), available at <http://www.unce.unr.edu/publications/files/nr/2004/fs0442.pdf>, archived at <http://perma.cc/8J3K-F6H5>; *Agriculture Pollution*, PROTECTING WATER, <http://protectingwater.com/agriculture.html> (last visited Nov. 11, 2014), archived at <http://perma.cc/EW5Y-J3HN>.

¹⁰ See e.g., *Chesapeake Bay and Virginia Waters Cleanup Plan*, VA. DEP’T OF ENVTL. QUALITY, <http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/NonpointSourcePollutionManagement/ChesapeakeBayandVirginiaWatersCleanupPlan.aspx> (last visited Nov. 11, 2014), archived at <http://perma.cc/A6DT-SMTC>. The Virginia Department of Environmental Quality notes:

[The] plan is comprehensive in nature and addresses point and nonpoint pollution sources, as well as air pollution. There are, however, specific elements of the plan related to nonpoint source pollution. Therefore from 2008 through 2014, the relevant portions of the cleanup plan are now considered Virginia’s Nonpoint Source Pollution Management Plan.

Id. The Chesapeake Bay states are New York, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia. See *The Chesapeake Bay Watershed*, CHESAPEAKE BAY PROGRAM, <http://www.chesapeakebay.net/discover/baywatershed> (last visited Nov. 11, 2014), archived at <http://perma.cc/Z2FM-ZQ3Q>.

¹¹ See COMM. ON THE MISS. RIVER & THE CLEAN WATER ACT, NAT’L RESEARCH COUNCIL OF NAT’L ACADS., MISSISSIPPI WATER QUALITY AND THE CLEAN WATER ACT: PROGRESS, CHALLENGES, AND OPPORTUNITIES 210–11 (2008), available at <http://biotech.law.lsu.edu/climate/docs/mississippi-pollution.pdf>, archived at <http://perma.cc/MAP8-9CX3>.

¹² Compare *The World Factbook: Australia*, CENT. INTELLIGENCE AGENCY, <https://www.cia.gov/library/publications/the-world-factbook/geos/as.html> (last visited Nov. 11, 2014), archived at <http://perma.cc/VS4X-5JHW> (demonstrating Australia has a smaller population, is more geographically isolated, is drier, and has fewer freshwater resources), with *The World Factbook: United States*, CENT. INTELLIGENCE AGENCY, <https://www.cia.gov/library/publications/the-world-factbook/geos/>

a result, Australia is only now beginning to experience significant water quality problems.¹³ As in the United States, many of Australia's emerging water quality problems are caused at least in part by nonpoint source pollution—or, as it is known there, “diffuse source” pollution.¹⁴ This development raises the question: Are there aspects of the U.S. experience in water quality regulation that might be instructive to Australian regulatory entities? Specifically, what interests in Australia are significant enough to prompt regulatory entities there to adopt diffuse source regulation, and particularly regulation of agriculture?

To answer these questions, it is necessary to understand the Australian legal and political systems and cultures and to ascertain the differences from the U.S. systems and cultures. The Australian legal system differs from the U.S. legal system in important ways.¹⁵ The U.S. republican system separates the executive, legislative, and judicial branches of the federal government, whereas the Australian parliamentary system, which operates within a constitutional monarchy, fuses the executive and legislative functions.¹⁶ The U.S. Constitution carves out a broad sphere of federal authority that overlaps considerably with the residual sovereignty of the fifty states, whereas the Australia Constitution more cleanly divides federal and state authority and more narrowly circumscribes the role of the federal government.¹⁷

Nevertheless, in Australia as in the United States, authority over nonpoint source regulation rests primarily with the states.¹⁸ Water quality issues are occurring in all Australian states, and in at least two of them—Victoria and Queensland—the issues have been significant enough pursue nonpoint source

us.html (last visited Nov. 11, 2014), archived at <http://perma.cc/V5JV-CDEM> (demonstrating the United States has a larger population, is less isolated, is wetter overall, and has more freshwater resources). Australia's total area is 7,741,200 sq. km.; the United States is 9,826,675 sq. km. *The World Factbook: Australia, supra*; *The World Factbook: United States, supra*. Australia's total renewable water resources in 2011 were 492 cu. km.; the United States's were 3069 cu. km. *The World Factbook: Australia, supra*; *The World Factbook: United States, supra*. Australia's July 2014 population was estimated at 22,507,617—the fifty-sixth most in the world; the United States' estimated population was 318, 892,103—the fourth most in the world. *The World Factbook: Australia, supra*; *The World Factbook: United States, supra*.

¹³ *The World Factbook: Australia, supra* note 12 (noting that poor water quality is one of Australia's current environmental issues).

¹⁴ Rebecca Nelson, *Regulating Nonpoint Source Pollution in the US: A Regulatory Theory Approach to Lessons and Research Paths for Australia*, 35 U. W. AUSTRALIAN L. REV. 340, 341–42 (2011) [hereinafter Nelson, *Regulating Nonpoint Source Pollution in the US*]. Australia's emerging water quality problems are particularly attributable to agricultural nonpoint source pollution. *Id.*

¹⁵ See AUSTRALIAN PARLIAMENTARY EDUC. OFFICE, PARLIAMENT VS CONGRESS: A COMPARISON OF THE AUSTRALIAN AND UNITED STATES FEDERAL POLITICAL SYSTEMS 1 (n.d.), available at <http://www.peo.gov.au/learning/closer-look/parliament-vs-congress.html>, archived at <http://perma.cc/VA39-6VKD>.

¹⁶ U.S. CONST. arts. I–III.

¹⁷ See *id.*

¹⁸ Nelson, *Regulating Nonpoint Source Pollution in the US, supra* note 14, at 342.

regulation.¹⁹ These states, however, are already diverging in their approach in regulating nonpoint source pollution—a national reaction substantially similar to the state and regional divergences in the United States.²⁰

This Article compares state nonpoint source regulation in the United States to nonpoint source regulation in the Australian states of Victoria and Queensland. Part I reviews the United States' history of water quality regulation since 1972 and the regulation of nonpoint source pollution, with a particular focus on proactive nonpoint source regulatory measures taken by Florida, Oregon, and Wisconsin.²¹ Part II details important differences between the United States and Australia with respect to water quality regulation, from constitutional aspects of federalism to the prominence of environmental citizen suits.²² Part III explores the state of Victoria's experiences with nonpoint source regulation, emphasizing the role of politics and the lack of a strong interest group supporting more stringent nonpoint source regulation.²³ Part IV presents an overview of Queensland's nonpoint source pollution and the Queensland Government's early attempts at regulation, emphasizing that nonpoint source pollution there directly harms the health of the Great Barrier Reef, an important source of revenue, cultural identity, and international significance.²⁴ This Article concludes that in Australia, as in the United States, the political and cultural framing of a nonpoint source pollution problem is critical to a state's willingness to regulate those sources of pollution.

I. THE U.S. EXPERIENCE WITH WATER QUALITY REGULATION AND NONPOINT SOURCES

A. Point Source Regulation Under the U.S. Federal Water Pollution Control Act Amendments of 1972

In 1972, the U.S. Congress substantially overhauled water quality regulation in the United States by amending the Federal Water Pollution Control Act

¹⁹ See *Clean Water*, DEP'T OF ENV'T, AUSTL. GOV'T, <http://www.environment.gov.au/clean-water> (last visited Nov. 11, 2014), archived at <http://perma.cc/L68K-EEV3>; *Topics*, DEP'T OF ENV'T & HERITAGE PROT., QUEENSL. GOV'T, <http://www.ehp.qld.gov.au/> (last visited Nov. 11, 2014), archived at <http://perma.cc/V24F-QHNW?type=image>; *What's New*, ENVTL. PROT. AUTH. S. AUSTL., <http://www.epa.sa.gov.au/> (last visited Nov. 11, 2014), archived at <http://perma.cc/UP2V-UDMF>.

²⁰ See, e.g., *Topics*, *supra* note 18; *What's New*, *supra* note 19.

²¹ See *infra* notes 25–183 and accompanying text.

²² See *infra* notes 184–281 and accompanying text.

²³ See *infra* notes 282–467 and accompanying text.

²⁴ See *infra* notes 468–521 and accompanying text. The Great Barrier Reef is considered one of the seven wonders of the natural world and is internationally cherished. See Matt Rosenberg, *Seven Wonders of the World*, ABOUT.COM, <http://geography.about.com/od/lists/a/sevenwonders.htm> (last visited Nov. 11, 2014), archived at <http://perma.cc/DA5K-266F> (explaining that the news network CNN first announced the Seven Natural Wonders of the World in 1997).

(“FWPCA”) to create what is now known as the Clean Water Act (CWA).²⁵ Previous versions of the FWPCA limited the federal government’s involvement in water quality regulation, focusing primarily on interstate and international water quality issues.²⁶ In addition, previous versions of the FWPCA focused on ambient water quality standards and enforcement to meet those targets.²⁷

Congress provided for pervasive federal regulatory authority over water quality in the CWA,²⁸ but only to the extent that quality-degrading pollution came from point sources.²⁹ The CWA also took on a changed regulatory focus, concentrating on what point sources were adding to the “waters of the United States” rather than on ambient water quality.³⁰

The CWA’s principal prohibition is that, except as in compliance with the Act, “the discharge of any pollutant by any person shall be unlawful.”³¹ The primary means for a point source polluter to comply with the CWA is to get one of two types of permits: either a National Pollutant Discharge Elimination System (“NPDES”) permit or a Section 404 permit.³² Although states are allowed to take over these two permitting programs, the state programs are required to meet federal minimum requirements, including those for effluent limitations.³³ In addition, the federal agencies put in charge of operating and enforcing the permitting programs, the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (the “Corps”), can never fully delegate their enforcement authority or responsibilities.³⁴

The EPA has the primary authority to implement the NPDES program, which applies to most point source discharges and limits the amount and con-

²⁵ Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251–1387 (2012) *amended by* Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (1972) (codified as amended at 33 U.S.C. §§ 1251–1387).

²⁶ *See* ROBIN KUNDIS CRAIG, *THE CLEAN WATER ACT AND THE CONSTITUTION: LEGAL STRUCTURE AND THE PUBLIC’S RIGHT TO A CLEAN AND HEALTHY ENVIRONMENT* 9–22 (2d ed. 2009).

²⁷ *See id.*

²⁸ *See id.* at 22–37.

²⁹ *See* 33 U.S.C. §§ 1311(a), 1342(a), 1344(a), 1362(12), 1362(14) (regulating “discharges of pollutants,” which the CWA defines to be additions of pollutants to waters from “point sources,” which it defines to be “any discernible, confined, and discrete conveyance”—like a pipe).

³⁰ *Id.*

³¹ 33 U.S.C. § 1311(a) (2012).

³² *Id.*; *see also id.* §§ 1342, 1344 (creating the two permit programs).

³³ 33 U.S.C. § 1311(b)–(e). Under the CWA, an effluent limitation is “any requirement established by a State or the Administrator [of the EPA] on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance.” *Id.* § 1362(11).

³⁴ 33 U.S.C. §§ 1342(i), 1344(n).

centration of pollutants that can be discharged.³⁵ Forty-six states have been delegated NPDES permit authority, subject to EPA oversight.³⁶ As a result, most NPDES permits come from state agencies.³⁷ The Section 404 permit program, administered by the Corps, is limited to discharges of dredged or fill material into the navigable waters, usually arising because people want to fill or drain wetlands, swamps, or small streams.³⁸ Only two states—Michigan and New Jersey—have been delegated Section 404 permitting authority, meaning the Corps still issues most Section 404 permits.³⁹

The CWA's definition of "discharge of a pollutant" creates a fundamental distinction among the types of sources subject to its regulation: federal requirements apply to point sources, while nonpoint sources are left to state regulatory programs.⁴⁰ The definition of point source, "any discernible, confined and discrete conveyance,"⁴¹ also makes several distinctions with respect to agricultural sources of water pollution.⁴² For example, the definition explicitly includes "concentrated animal feeding operations," but it explicitly excludes "agricultural stormwater discharges" and "return flows from irrigated agriculture."⁴³ The NPDES permit provisions emphasize this last exception, specifying that "[t]he Administrator [of the EPA] shall not require a permit under this section for discharges composed entirely of return flows from irrigated agriculture, nor shall the Administrator directly or indirectly, require any State to require such a permit."⁴⁴

³⁵ *Id.* § 1342.

³⁶ *Id.* § 1342(b)–(d), (i); see STATE NPDES PROGRAM AUTHORITY, U.S. ENVTL. PROT. AGENCY (n.d.), available at http://www.epa.gov/npdes/images/State_NPDES_Prog_Auth.pdf, archived at <http://perma.cc/94A8-CTY7>.

³⁷ STATE NPDES PROGRAM AUTHORITY, *supra* note 36.

³⁸ See 33 U.S.C. § 1344(a) (2012). Most normal farming activities are exempt from this permit program. *Id.* § 1344(f). Persons who dredge or fill waters of the United States—usually wetlands, swamps, or shallow streams during construction activities—must apply for a Section 404 permit. See *id.* Most normal farming activities are exempt from Section 404 permits. *Id.*

³⁹ *State or Tribal Assumption of the Section 404 Permit Program*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/type/wetlands/outreach/fact23.cfm> (last updated July 1, 2014), archived at <http://perma.cc/PM68-4HFP> ("To date, two States, Michigan and New Jersey, have assumed administration of the Federal permit program."). Failure to assume federal CWA authority, however, does not preclude state-law regulation of dredging and filling, and, as the EPA notes, "[m]ore than a dozen States already are currently administering aquatic resources/wetlands protection programs similar to the Federal Section 404 program." *Id.*

⁴⁰ 33 U.S.C. §§ 1329, 1362(12).

⁴¹ *Id.* § 1362(14) (including a pipe, ditch, or channel).

⁴² See *id.*

⁴³ *Id.* § 1362(12); see *id.* § 1362(14); *Concentrated Animal Feeding Operations*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/region8/concentrated-animal-feeding-operations> (last updated Mar. 16, 2014), archived at <http://perma.cc/F3PV-B3WM>.

⁴⁴ 33 U.S.C. § 1342(l)(1) (2012).

Most of the discharge terms in a NPDES permit derive from national technology-based effluent limitations.⁴⁵ The EPA establishes effluent limitations on an industry-by-industry basis, and the numeric limitations on concentrations or discharge amounts reflect the technologies available to the particular industry to control the discharge of pollutants.⁴⁶ The NPDES permit also specifies monitoring requirements and requires the discharger to submit daily monitoring reports to the relevant state agency and to the EPA.⁴⁷

In contrast, most of the terms in a Section 404 permit derive from the Corps' public interest review and the EPA's Section 404(b)(1) Guidelines.⁴⁸ These standards seek to locate activities in uplands in order to protect the ecological values and other important uses of the nation's waters, to minimize the destruction of waterways and wetlands, and to require mitigation when destruction or harm cannot be avoided.⁴⁹

Despite this focus on permits, however, Congress did not eliminate concerns about ambient water quality with the 1972 Act. Instead, the CWA uses water quality standards, which represent the ambient water quality goals for a particular water body—such as a river, stream, or lake—to provide a regulatory check on source-based permitting.⁵⁰ Specifically, the CWA requires each state to set water quality standards for the waters within its borders.⁵¹ If the state fails to set these standards, the EPA will do so, effectively federalizing the state's water quality goals.⁵² For each water body, the state establishes the two components of water quality standards: (1) designated uses, which are the uses that the state wants the water body to be able to support, even if aspirational; and (2) water quality criteria, which are the numeric or narrative descriptions of the water quality necessary to support the designated uses.⁵³ In addition, as

⁴⁵ See *id.* § 1311(b).

⁴⁶ See *id.*

⁴⁷ *Id.* § 1318. These reports are public records, and falsifying the monitoring reports is a federal crime. *Id.* §§ 1318(b), 1319(c)(3).

⁴⁸ 33 C.F.R. § 320.4 (2013) (the Corps' public interest review); 40 C.F.R. § 230 (2013) (the EPA's Section 404(b)(1) Guidelines).

⁴⁹ See generally 33 C.F.R. § 320.4 and 40 C.F.R. § 230 (identifying special aquatic sites to be protected, creating presumptions against non-water-dependent activities being situated in wetlands and other special aquatic sites, requiring minimization and mitigation, and identifying a host of factors to be considered before a permit can be issued).

⁵⁰ 33 U.S.C. § 1313(a) (2012); see 40 C.F.R. pt. 130 (2013) (codifying the EPA regulations governing water quality standards).

⁵¹ 33 U.S.C. § 1313(a).

⁵² *Id.* § 1313(b); see Colleen Maker, Comment, *Swimming Away from the Zone of Reasonableness: Upper Blackstone and the Need for Numeric Water Quality Criteria*, 41 B.C. ENVTL. AFF. L. REV. 295, 300 (2014) (noting that the EPA prefers to take a "hands-off" approach).

⁵³ 33 U.S.C. § 1313(c)(2)(A).

part of its water quality standards requirements for *all* water bodies, the state must also adhere to an anti-degradation policy.⁵⁴

Because states set different kinds of water quality standards, situations can arise where the standard technology-based effluent limitations are insufficient to ensure that a particular water body's water quality standards are met.⁵⁵ In those circumstances, the state permitting agency or the EPA must create discharger-specific "water quality based" effluent limitations for the discharger's NPDES permit.⁵⁶

Water quality standards also lead to one of the CWA's few ways of acknowledging nonpoint source pollution. If permitting adjustments to point sources are not sufficient to allow a water body to comply with its water quality standards, the water body is deemed water-quality-limited or impaired.⁵⁷ Under the CWA, states must identify, list, and prioritize their impaired water bodies in triennial reports to the EPA.⁵⁸ In priority order, the state must then determine the total maximum daily load ("TMDL") for each problematic pollutant for each listed water body.⁵⁹ This TMDL is then divided among the point and nonpoint sources that contribute those pollutants to the water body, with a margin of safety.⁶⁰ As a result, TMDLs often create incentives for addressing nonpoint source pollution.⁶¹

If a point source discharger receives a NPDES permit or a Section 404 permit and complies with its terms, the CWA deems the discharger to be complying with the Act, with limited exceptions, and thus insulated from govern-

⁵⁴ 40 C.F.R. § 131.12 (2013) (the EPA's antidegradation policy); see *Antidegradation Policy*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/scitech/swguidance/standards/adeq.cfm> (last updated Mar. 6, 2012), *archived at* <http://perma.cc/Q8SZ-GXSU>. Under the antidegradation policy, Tier I requirements protect all uses of the water body that existed in 1975. *Antidegradation Policy*, *supra*. The state must also prevent Tier I waters from degrading further. *Id.* Tier II waters are waters that were fishable and swimmable at the time of designation. *Id.* After an elaborate administrative process, states can allow some degradation of Tier II waters to promote economic growth and wellbeing. *Id.* Finally, Tier III waters are usually referred to as "outstanding natural resource waters"—the pristine or near-pristine waters left in the United States, generally consisting of mountain lakes and streams and waters in some national and state parks. *Id.* As with Tier I waters, states cannot allow any degradation of waters that they choose to designate as Tier III. *Id.* As a result, many states have created what has become known as Tier II ½—waters that are recognized as having outstanding water quality, but for which the state reserves the right to allow some degradation. *Id.*

⁵⁵ See 33 U.S.C. § 1312(a) (requiring water-quality-based effluent limitations in these circumstances).

⁵⁶ 33 U.S.C. §§ 1311(b)(1)(C), 1312 (2012).

⁵⁷ See *id.* § 1313(d)(1)–(2).

⁵⁸ *Id.*

⁵⁹ *Id.* §§ 1313(d)(1)(D), 1314(a)(2). The TMDL is the total amount of the pollutant or pollutants causing the impairment that can be added to the water body each day and still have the water body meet its water quality standards. *Id.*

⁶⁰ See *id.*

⁶¹ See *supra* notes 50–60 and accompanying text.

ment penalties or citizen suits.⁶² Failure to obtain a required permit or non-compliance with an issued permit, however, are violations of the CWA, rendering the discharger strictly liable for administrative and civil court penalties up to \$37,500 per day, per violation.⁶³ Further, negligent and knowing violations can make the discharger criminally liable for fines or jail sentences, or both.⁶⁴

Congress also included a citizen suit provision in the CWA.⁶⁵ This provision allows any “person or persons [who] have an interest which is or may be adversely affected” to bring a lawsuit against: (1) any person or entity, including federal and state governments, who is violating the Act; or (2) the Administrator of the EPA for failure “to perform any act or duty under [the CWA] which is not discretionary with the Administrator.”⁶⁶ Citizen suits, although occasionally controversial, have helped to propel implementation and improvement of water quality regulation in the United States.⁶⁷

B. Addressing Nonpoint Sources Through Congressional Fiat: Stormwater Regulation

Nonpoint source pollution has been recognized since at least the 1980s as one of the last remaining major water quality problems in the United States.⁶⁸ Over the course of the CWA’s history, certain water quality problems originally deemed nonpoint source problems have been reclassified as point source problems.⁶⁹ The most important and far-reaching of these reclassifications occurred in the 1987 Stormwater Amendments, which acknowledged that captured, channeled, and piped stormwater should be treated as point source pollution.⁷⁰

⁶² See 33 U.S.C. § 1342(k) (2012).

⁶³ *Id.* § 1319(a)–(b), (d), (g).

⁶⁴ *Id.* § 1319(c). Federal and state governments, as a practical matter, tend to reserve criminal enforcement for truly egregious violations that endanger human lives or cause significant environmental harm. See *Summary of Criminal Prosecutions*, U.S. ENVTL. PROT. AGENCY, <http://www2.epa.gov/enforcement/summary-criminal-prosecutions> (last updated Mar. 16, 2014), archived at <http://perma.cc/7FTU-L7N5>.

⁶⁵ 33 U.S.C. § 1365.

⁶⁶ *Id.* § 1365(a), (g).

⁶⁷ See Eugene C. McCall Jr. & Ryan W. Trail, *Citizen Suits to Enforce Federal Environmental Laws*, S.C. LAWYER, July 2011, at 35, 38–39, available at https://www.masc.sc/SiteCollectionDocuments/Utilities%20and%20Public%20Works/permitting_regulatory_handout.pdf, archived at <http://perma.cc/5QQC-LKVC>.

⁶⁸ See *Nonpoint Source Pollution: The Nation’s Largest Water Quality Problem*, *supra* note 1.

⁶⁹ See generally Robin Kundis Craig, *Local or National? The Increasing Federalization of Nonpoint Source Pollution Regulation*, 15 J. ENVTL. L. & LITIG. 179 (2000) (detailing the history and development of the CWA’s treatment of nonpoint source pollution).

⁷⁰ See 33 U.S.C. § 1342(p) (2012).

Specifically, Congress amended the CWA to require municipal and industrial stormwater discharges to obtain NPDES permits.⁷¹ The EPA implemented this requirement through phased regulations, starting with the largest sources first.⁷² In 2009, the EPA began working on a new national rulemaking to strengthen the stormwater program, and spent much of 2010 soliciting information from stakeholders.⁷³ This rulemaking is still ongoing.⁷⁴

C. State Nonpoint Source Programs

1. The Clean Water Act and State Nonpoint Source Programs

As noted, the CWA's definition of "discharge of a pollutant" leaves nonpoint source regulation almost entirely to the states.⁷⁵ As part of the 1987 Stormwater Amendments, Congress also encouraged states to enact nonpoint source management programs by providing grants and technical assistance to states that enacted programs that met certain minimum criteria.⁷⁶ Congress hoped states would identify "the best management practices and measures which will be undertaken to reduce pollutant loadings resulting from each category, subcategory, or particular nonpoint source."⁷⁷ It instructed states to "use regulatory and nonregulatory programs to achieve implementation of the best management practices" ("BMPs") by those nonpoint sources.⁷⁸

Agricultural nonpoint source pollution is a large facet of most state nonpoint source control problems, because agricultural nonpoint source pollution

⁷¹ See Amanda Neidert, *Under Construction: Developments in NPDES Storm Water Permits for Construction Activities*, 8 WATER QUALITY & WETLANDS COMM. NEWSL. (Am. Bar Ass'n), Sept. 2008, at 6, 6, available at http://apps.americanbar.org/environ/committees/waterquality/newsletter/sep08/WaterQual_Sept08.pdf, archived at <http://perma.cc/96A7-FU4C>.

⁷² See *id.* The EPA provides considerable information on its website about the stormwater permit program. *Stormwater Basic Information*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/npdes/stormwater/Stormwater-Basic-Information.cfm> (last updated July 15, 2014), archived at <http://perma.cc/J3ZV-GL2L>; *Stormwater Homepage*, U.S. ENVTL. PROT. AGENCY, http://cfpub.epa.gov/npdes/home.cfm?program_id=6 (last updated Sept. 9, 2014) archived at <http://perma.cc/QZQ8-NP45>.

⁷³ *Stakeholder Input on Proposed Rulemaking and National Listening Sessions*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/npdes/stormwater/Stakeholder-Input-on-Proposed-Rulemaking-and-National-Listening-Sessions.cfm> (last updated July 14, 2014), archived at perma.cc/PZ28-A7WW.

⁷⁴ *Proposed National Rulemaking to Strengthen the Stormwater Program*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/npdes/stormwater/Proposed-National-Rulemaking-to-Strengthen-the-Stormwater-Program.cfm> (last updated July 14, 2014), archived at <http://perma.cc/4ABU-76EX>.

⁷⁵ See *supra* notes 40–44 and accompanying text.

⁷⁶ See Water Quality Act of 1987, Pub. L. No. 100-4, 101 Stat. 7 (1987).

⁷⁷ See *id.*

⁷⁸ See *id.*

is a significant cause of remaining water quality impairments.⁷⁹ In 1996, the EPA noted that “agricultural nonpoint source (‘NPS’) pollution is the leading source of water quality impacts to surveyed rivers and lakes, the third largest source of impairments to surveyed estuaries, and also a major contributor to ground water contamination and wetlands degradation.”⁸⁰ If anything, in the years since 1996, agricultural nonpoint source pollution has become an even more significant cause of water quality impairment.⁸¹ According to the EPA, states continue to report that “agricultural nonpoint source . . . pollution was the leading source of water quality impacts on surveyed rivers and lakes, the second largest source of impairments to wetlands, and a major contributor to contamination of surveyed estuaries and ground water,” and states have created a variety of programs to try to address this problem.⁸²

Most states have approved nonpoint source management programs, and most of these programs address agricultural nonpoint source pollution explicitly.⁸³ Nevertheless, the programs are far from uniform and, in fact, vary widely.⁸⁴ Each plan is different regarding: (1) whether it employs mandatory regulatory—as opposed to voluntary—measures; (2) whether and how stringently it addresses agricultural nonpoint source pollution; and (3) its overall effectiveness.⁸⁵ There are thus fifty unique nonpoint source programs in the United States.⁸⁶

A 2012 Environmental Defense Fund survey found that only nineteen states in the United States regulate—meaning that they impose mandatory, enforceable requirements on—agricultural nonpoint sources, and even those states vary considerably regarding the conditions for triggering such mandatory requirements.⁸⁷ Three of the nineteen states—Florida, Oregon, and Wisconsin

⁷⁹ See *Managing Nonpoint Source Pollution from Agriculture*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/nps/outreach/point6.cfm> (last updated Aug. 22, 2012), archived at perma.cc/5A5L-EC8F.

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² *Agriculture*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/polwaste/nps/agriculture.cfm> (last updated July 9, 2014), archived at perma.cc/6QHD-4ZEY.

⁸³ See generally ROBIN KUNDIS CRAIG & TERRY SCHLEY NOTO, ENVTL. DEF. FUND, STATE NONPOINT SOURCE CONTROL PROGRAMS FOR AGRICULTURE: A LOOK AT AGRICULTURAL CERTAINTY (2012) (on file with authors) (surveying all fifty states’ nonpoint source programs and their treatment of agriculture).

⁸⁴ See *id.* at 6–8, 22–57 (identifying and discussing nineteen states with at least some mandatory requirements for agricultural nonpoint sources, and noting that the rest of the states rely, with considerable variation, on voluntary measures).

⁸⁵ See *id.*

⁸⁶ See *id.*

⁸⁷ See *id.* For example, many of these nineteen states tie agricultural nonpoint source regulation to the existence of a TMDL on a particular waterway, otherwise leaving agricultural nonpoint sources unregulated. See *id.*

sin—illustrate why states might choose to regulate nonpoint sources, and particularly agricultural nonpoint source pollution.⁸⁸ There are some notable commonalities between these three states: (1) each state imposes at least some mandatory requirements on agricultural sources of water pollution not subject to the federal NPDES permit requirement; (2) agriculture is a significant component of each state's economy; (3) each state's program seeks, in part, to redress problems with water quality standards identified through the CWA, stressing the importance of that Act in prompting nonpoint source regulation; (4) each state has significant and politically salient non-agricultural interests in water quality (showing how such other interests can help prompt regulation); (5) each state's program has been deemed to be at least partially effective in addressing agricultural water pollution; and (6) each state takes a slightly different approach to addressing agricultural sources, thus demonstrating a range of regulatory possibilities for agricultural water quality programs.⁸⁹

a. Florida

Florida is a major American agricultural state, ranking seventh among the agricultural exporting states in 2011, with agricultural exports of over \$4 billion.⁹⁰ Although agriculture is an important economic sector in the state, however, it is certainly not the only one. “The tourism industry has an economic impact of \$76 billion on Florida's economy.”⁹¹ Moreover, although Florida is known for its beaches, a significant portion of its tourism industry is based on freshwater recreation, especially sport fishing and tourism at Florida's hundreds of springs, many of which are home to charismatic manatees.⁹² Thus, when nonpoint source pollution threatens these freshwater amenities, there is considerable economic and cultural interest in protecting them.⁹³

⁸⁸ See *id.*

⁸⁹ See *id.*

⁹⁰ *Florida Agriculture Overview and Statistics*, FLA. DEP'T OF AGRIC. & CONSUMER SERVS., <http://www.freshfromflorida.com/Divisions-Offices/Marketing-and-Development/Education/For-Researchers/Florida-Agriculture-Overview-and-Statistics> (last visited Nov. 11, 2014), archived at <http://perma.cc/XL8K-SJHN>.

⁹¹ See CHARLES A. FLINK, FLA. GATEWAYS & TRAILS FOUND., FLORIDA COAST-TO-COAST CONNECTOR ECONOMIC BENEFITS AND MARKET REPORT 3 (2013), available at <http://www.dep.state.fl.us/gwt/community/PDF/Florida%20Coast%20to%20CoastConnector%20-%20Economic%20Benefits%20and%20Market%20Report.pdf>, archived at <http://perma.cc/ADT4-EENA>.

⁹² JIM STEVENSON ET AL., FLA. SPRINGS TASK FORCE, FLORIDA'S SPRINGS: STRATEGIES FOR PROTECTION & RESTORATION 14–21 (2000), available at <http://www.dep.state.fl.us/springs/reports/files/SpringsTaskForceReport.pdf>, archived at <http://perma.cc/EGJ6-4VKC>; *The Economic Impact of Freshwater Fishing in Florida*, FLA. FISH & WILDLIFE CONSERVATION COMM'N, <http://myfwc.com/conservation/value/freshwater-fishing/> (last visited Nov. 11, 2014), archived at perma.cc/LRM6-QDVB.

⁹³ See *supra* notes 90–92 and accompanying text.

In 1970, Florida began cataloguing its nonpoint source pollution issues,⁹⁴ and funding from the CWA allowed the state to study nonpoint source pollution in 1976.⁹⁵ These studies revealed that nonpoint source pollution contributed over half of the pollution entering Florida's surface waters and over seventy-five percent of the pollution entering its lakes.⁹⁶ The studies also concluded that "[i]t is far easier and much more cost-effective to prevent or minimize nonpoint sources of pollution, especially from new land use activities, than it is to restore polluted water bodies."⁹⁷ As a result, Florida began to implement nonpoint source management programs in the late 1970s, including an Agricultural Nonpoint Source Management Plan ("Agricultural Plan"), which the EPA approved in 1978.⁹⁸ As early as 1979, the Agricultural Plan included a regulatory backstop if agricultural and forestry nonpoint sources did not implement BMPs.⁹⁹

The Florida Department of Environmental Protection ("FDEP") implements Florida's CWA Nonpoint Source Management Program ("NSMP").¹⁰⁰ FDEP presents nonpoint source management as "Florida Friendly" practices that protect the state's extensive natural resources, including the ocean and beaches, estuaries, water supplies, and wildlife.¹⁰¹ The NSMP clearly reflects the importance of nature-related tourism to Florida's economy.¹⁰² Indeed, much of Florida's urban nonpoint source management has its roots in a 1994 voluntary program in the Sarasota-Tampa Bay region of the state, crafted to protect the estuary and beaches in the region.¹⁰³ More recently, nutrient runoff from agricultural operations has been identified as a significant source of water quality impairment in Florida's freshwater springs, the Everglades—the huge

⁹⁴ WATERSHED MGMT. PROGRAM, FLA. DEP'T OF ENVTL. PROT., NONPOINT SOURCE COMPONENTS OF TOTAL MAXIMUM DAILY LOADS 5 (1998), available at <http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/npsfinal.pdf>, archived at <http://perma.cc/L4CJ-5XG6>.

⁹⁵ *Id.*

⁹⁶ *Id.*

⁹⁷ *Id.*

⁹⁸ *Id.* at 6.

⁹⁹ *Id.* at 72.

¹⁰⁰ Coastal Zone Management Act of 1972 (CZMA), 16 U.S.C. §§ 1451–1465 (2012). FDEP receives approximately \$9 million per year in CWA federal grants. *See id.* Florida also addresses nonpoint source pollution through a program approved pursuant to the federal CZMA. *Id.*

¹⁰¹ *See* NONPOINT SOURCE MGMT. SECTION, FLA. DEP'T OF ENVTL. PROT., STATE OF FLORIDA ANNUAL REPORT: NONPOINT SOURCE MANAGEMENT PROGRAM 10 (2010), available at <http://www.dep.state.fl.us/water/nonpoint/docs/319h/2010AnnualReport319h.pdf>, archived at <http://perma.cc/8CE2-A9WA>.

¹⁰² *See id.*

¹⁰³ *See generally* MARK ALDERSON ET AL., SARASOTA BAY NAT'L ESTUARY PROGRAM, FRAMEWORK FOR ACTION: SARASOTA BAY NATIONAL ESTUARY PROGRAM (Paul Roat et al. eds, 1992), available at http://sarasotabay.org/documents/SBNEP_Framework_for_Action.pdf, archived at <http://perma.cc/GM67-FTRH> (detailing the 1994 voluntary program).

“river of grass” that originally occupied about two-thirds of the peninsula—and the coral reefs at the southern end of the state.¹⁰⁴

Florida has an extensive agricultural nonpoint source program that even includes the state’s golf courses.¹⁰⁵ To implement the program, FDEP works with the Florida Department of Agriculture and Consumer Services (“FDACS”).¹⁰⁶ Florida seriously began to address agricultural nonpoint source pollution in 1994, when elevated nitrate levels were documented in local drinking water supplies.¹⁰⁷ This program was strengthened in 1999, when the state began to implement CWA TMDLs.¹⁰⁸

Mandatory requirements for agricultural nonpoint sources in Florida are tied to actual water quality impairments, as measured by Florida’s CWA water quality standards, wherever those impairments occur.¹⁰⁹ For example, agricultural nonpoint sources included within a Basin Management Action Plan (“BMAP”) area—designed to address specific and identified water quality problems in a particular region or watershed—must either implement state-established BMPs or conduct state-mandated water quality monitoring to prove that their discharges meet state water quality standards and hence are not contributing to the problem.¹¹⁰ In addition, when a water body is subject to a TMDL, the FDACS identifies BMPs and other measures that agricultural sources must use to ensure that the TMDL is met.¹¹¹ Each agricultural nonpoint source must keep records regarding BMPs, which FDACS inspects to verify

¹⁰⁴ See, e.g., *Hazards to Coral Reefs*, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <http://www.coris.noaa.gov/about/hazards/> (last updated Jan. 30, 2014), *archived at* perma.cc/F46H-KQ7K; *Phosphorus*, FRIENDS OF THE EVERGLADES, <http://www.everglades.org/phosphorus/> (last visited Nov. 11, 2014), *archived at* perma.cc/GMU2-SKFT; *Understanding Algal Blooms*, ST. JOHNS RIVER WATER MGMT. DIST., <http://floridaswater.com/algae/> (last updated June 3, 2014), *archived at* perma.cc/4L7W-8LWN.

¹⁰⁵ *Agricultural Pollution Prevention*, FLA. DEP’T OF ENVTL. PROT., <http://www.dep.state.fl.us/water/nonpoint/agsrc.htm> (last updated Sept. 21, 2011), *archived at* perma.cc/U5FX-AGS8.

¹⁰⁶ See *id.*

¹⁰⁷ FLA. DEP’T OF AGRIC. & CONSUMER SERVS., *FLORIDA’S AGRICULTURAL WATER POLICY: ENSURING RESOURCE AVAILABILITY 18* (2003).

¹⁰⁸ *Id.*

¹⁰⁹ See FLA. STAT. § 403.067(7) (2010).

¹¹⁰ See *id.* BMAP areas include the Northern Everglades and eighteen other areas that the FDEP has identified to date. See WATERSHED PLANNING & COORDINATION SECTION, FLA. DEP’T OF ENVTL. PROT., *TMDL IMPLEMENTATION: BASIN MANAGEMENT ACTION PLANS* (2014), *available at* http://www.dep.state.fl.us/water/watersheds/docs/bmap/bmap_activities.pdf, *archived at* <http://perma.cc/5GV7-EKYD> (mapping the area covered by BMAPs).

¹¹¹ See FLA. STAT. § 403.067(7).

BMP implementation.¹¹² Cost sharing is available to help with implementation.¹¹³

For all other agricultural sources, Florida has created a voluntary enrollment program to provide incentives to farmers to implement water quality BMPs.¹¹⁴ Farmers who enroll in the program and properly implement the prescribed BMPs receive a number of legal and monetary benefits.¹¹⁵ For example, under Florida law, enrolled farmers are presumed to be complying with state water quality requirements, and under Florida's Right to Farm Act, they are largely insulated from additional local regulation.¹¹⁶ In addition, conforming farmers might be eligible for cost-share programs and may receive advantages in various kinds of permitting.¹¹⁷ Although few studies have tracked the effectiveness of Florida's agricultural nonpoint source program in actually improving water quality, in 2010 (the last year for which such data are available), the EPA's removal of fifty-four previously impaired waterways from Florida's list of waters not meeting their water quality standards—many of which had been impaired for nutrients—supports the inference that the program has worked.¹¹⁸

b. Oregon

Agriculture accounted for \$5.4 billion in revenue in Oregon in 2012.¹¹⁹ Oregon also has a strong outdoor recreational industry, however, worth about \$2.5 billion in 2008.¹²⁰ Much of this outdoor recreation is concentrated in and

¹¹² KATI W. MIGLIACCIO & BRIAN J. BOMAN, UNIV. OF FLA., TOTAL MAXIMUM DAILY LOADS AND AGRICULTURAL BMPs IN FLORIDA 3 (2013), available at <http://edis.ifas.ufl.edu/pdf/files/AE/AE38800.pdf>, archived at perma.cc/AN9K-BWSF.

¹¹³ *Agricultural Pollution Prevention*, supra note 105.

¹¹⁴ *Water Quality Credit Trading and the Pollutant Trading Policy Advisory Committee*, FLA. DEP'T OF ENVTL. PROT., <http://www.dep.state.fl.us/water/watersheds/ptpac.htm> (last updated Sept. 21, 2011), archived at <http://perma.cc/B4M3-EMUD>.

¹¹⁵ *Id.*

¹¹⁶ FLA. DEP'T OF AGRIC. & CONSUMER SERVS., BEST MANAGEMENT PRACTICES: TO YOUR ADVANTAGE (2010), available at <https://www.freshfromflorida.com/content/download/7344/117602/BmpArticle100608.pdf>, archived at <http://perma.cc/7ZYU-APXV>.

¹¹⁷ *Id.*

¹¹⁸ *Florida Previously 303(d)-Listed Waters Now Attaining All Applicable Water Quality Standards in 2010*, U.S. ENVTL. PROT. AGENCY, http://iaspub.epa.gov/tmdl/attains_state_restoration_detail?p_state=FL&p_restored_cycle=2010&p_state_name=Florida (last updated Nov. 11, 2014), archived at <http://perma.cc/G9LY-72HH>.

¹¹⁹ OR. DEP'T OF AGRIC., OREGON AGRICULTURE: FACTS AND FIGURES (2014), available at http://www.nass.usda.gov/Statistics_by_State/Oregon/Publications/facts_and_figures/facts_and_figures.pdf, archived at perma.cc/P5F6-FKRU.

¹²⁰ DEAN RUNYAN ASSOCS., FISHING, HUNTING, WILDLIFE VIEWING, AND SHELLFISHING IN OREGON: 2008 STATE AND COUNTY EXPENDITURE ESTIMATES 6 (2009), available at [http://www.dfw.state.or.us/agency/docs/Report_5_6_09--Final%20\(2\).pdf](http://www.dfw.state.or.us/agency/docs/Report_5_6_09--Final%20(2).pdf), archived at perma.cc/G9U4-9C6Z.

around Oregon's many rivers and streams and on the iconic salmon and steelhead that they contain.¹²¹ A 2009 study estimated that salmon in the Rogue River in southern Oregon generated annual economic values of \$1.4 million associated with commercial fishing, \$16 million associated with recreational fishing, and \$1.5 billion associated with non-use values, such as the existence values of knowing the fish exist and the bequest values of wanting to ensure that salmon exist for future generations.¹²²

Salmon are a particularly strong driver of water quality concerns in Oregon for other reasons as well. Salmon are economically, recreationally, culturally, and spiritually important to Oregon's population, and further, Oregon's multiple federally recognized Native American tribes have federally enforceable treaty rights to salmon fishing.¹²³ Water quality requirements for salmon and other aquatic life have thus dictated many of Oregon's water quality standards¹²⁴ and hence contribute to many of Oregon's TMDLs.¹²⁵ In addition, many salmon species are now listed for protection under the federal Endangered Species Act (ESA),¹²⁶ which drives enforcement of salmon-related water quality requirements.¹²⁷ In many parts of the state, the health of salmon runs

¹²¹ See, e.g., OR. DEP'T OF FISH & WILDLIFE, 2014 OREGON SPORT FISHING REGULATION 2 (2014), available at http://www.dfw.state.or.us/fish/docs/2014/Oregon_Sport_Fishing_Regs_v12-31-13.pdf, archived at perma.cc/UM68-53JY.

¹²² See TED L. HELVOIGT & DIANE CHARLTON, ECONORTHWEST, THE ECONOMIC VALUE OF ROGUE RIVER SALMON 1, 18–22 (2009), available at <https://www.americanrivers.org/assets/pdfs/wild-and-scenic-rivers/the-economic-value-of-rogue.pdf>, archived at <http://perma.cc/5M73-DMWV>.

¹²³ United States v. Oregon, 718 F.2d 299, 303–05 (9th Cir. 1983); *Sohappy v. Smith*, 302 F. Supp. 899, 904–07 (D. Or. 1969).

¹²⁴ OR. DEP'T OF ENVTL. QUALITY, OREGON NONPOINT SOURCE PLAN, *supra* note 7, at 4–7 (noting that Oregon's water quality standards generally protect the most sensitive use, and aquatic life are usually the most sensitive use).

¹²⁵ *Id.* (noting that many water quality impairments in Oregon—and hence 303(d) listings—arise from violations of the aquatic life temperature standards and standards for fish consumption); see also JULIA CROWN ET AL., OR. DEP'T OF ENVTL. QUALITY, ROGUE RIVER BASIN TMDL, at i (2008), available at <http://www.deq.state.or.us/wq/tmdls/docs/roguebasin/Rogue/Chapter1andExecutiveSummary.pdf>, archived at <http://perma.cc/383K-XKFM> (creating a TMDL to protect human health, salmon, and trout); EPA Approval of Water Quality Standards for the State of Oregon, U.S. ENVTL. PROT. AGENCY, <http://yosemite.epa.gov/r10/water.nsf/Water+Quality+Standards/ORTempWQSRevisions> (last updated Oct. 27, 2014), archived at <http://perma.cc/VU96-KHD8> (describing some of Oregon's salmon-related water quality standards).

¹²⁶ Endangered Species Act of 1972 (ESA), 16 U.S.C. §§ 1531–1544 (2012); see also *West Coast Salmon & Steelhead Listings*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. FISHERIES SERV., http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/salmon_and_steelhead_listings/salmon_and_steelhead_listings.html (last visited Nov. 11, 2014), archived at perma.cc/BYU2-PBEN (providing an overview of the twenty-eight listed species of salmon and steelhead on the west coast of the United States, nineteen of which are found in Oregon).

¹²⁷ OR. DEP'T OF ENVTL. QUALITY, OREGON NONPOINT SOURCE PLAN, *supra* note 7, at 4–7.

and local water quality is tied directly to agricultural,¹²⁸ forestry,¹²⁹ and ranching nonpoint source pollution.¹³⁰ Salmon are also the focus of more general Oregon water quality improvement efforts, including the 1997 statewide Oregon Plan for Salmon and Watersheds.¹³¹

Oregon developed its nonpoint source management program in response to the 1987 amendments to the CWA, and the EPA first approved Oregon's program in 1991.¹³² Oregon then expanded its program noticeably in 2000 in response to EPA guidance requiring state nonpoint source programs to address nine "key elements" to receive federal funding.¹³³ The 2000 Nonpoint Source Control Program (the "Program") focused extensively on the water quality needs of ESA-listed salmon and steelhead.¹³⁴ Thus, although agriculture is certainly not the only threat to salmon-supporting water quality, Oregon's nonpoint source program clearly links agriculture to the endangered and continually threatened salmon and steelhead species.¹³⁵

The Program also tracks Oregon's statewide land use planning categories.¹³⁶ To date, there are forty-three different programs that address nonpoint source pollution based on type of land use.¹³⁷ Similar to Florida, Oregon has federally-approved Nonpoint Source Management Plans pursuant to both the CWA and the Coastal Zone Management Act ("CZMA"), and it also uses nonpoint source management as part of its TMDL program.¹³⁸

¹²⁸ NAT'L OCEANIC & ATMOSPHERIC ADMIN. FISHERIES SERV., WATER QUALITY: HOW TOXIC RUNOFF AFFECTS PACIFIC SALMON & STEELHEAD 1 (2012), available at http://www.westcoast.fisheries.noaa.gov/publications/habitat/fact_sheets/stormwater_fact_sheet.pdf, archived at perma.cc/T4EU-S2NR.

¹²⁹ Joshua Zaffos, *Oregon Ignores Logging Road Runoff, to the Peril of Native Fish*, HIGH COUNTRY NEWS (Colorado), July 27, 2012, at 1, available at <http://www.hcn.org/issues/44.12/oregon-ignores-logging-road-runoff-to-the-peril-of-native-fish>, archived at perma.cc/4M4Z-L826.

¹³⁰ See generally *Or. Natural Desert Ass'n v. Dombeck*, 172 F.3d 1092 (9th Cir. 1998) (discussing the issue of nonpoint source pollution from cattle in Oregon).

¹³¹ *Oregon Plan for Salmon and Watersheds*, OREGON.GOV, http://www.oregon.gov/OPSW/pages/about_us.aspx#What_is_the_Oregon_Plan_for_Salmon_and_Watersheds (last visited Nov. 11, 2014), archived at perma.cc/GJ4D-9TWJ.

¹³² OR. DEP'T OF ENVTL. QUALITY, OR. NONPOINT SOURCE PLAN, *supra* note 7, at 1-1.

¹³³ *Id.*

¹³⁴ See, e.g., *id.* at 7-1. The Program noted that agriculture "accounts for [seventeen] percent of the water quality limited stream miles" in the Klamath Basin's salmon and steelhead habitat; that eighty-seven miles of water-quality-limited streams in the Columbia River Basin are adjacent to agriculture and rangelands; that agricultural lands surrounded over half of the water-quality-limited water bodies in the Upper Willamette River Basin; and that rangeland and agricultural lands represent thirty-seven percent of the water-quality-limited stream miles in the Snake River Basin. See *id.* at 4-14 to -15, 4-18, 4-20.

¹³⁵ See *supra* notes 130-133 and accompany text.

¹³⁶ *Nonpoint Source Program Implementation*, OREGON.GOV, <http://www.deq.state.or.us/wq/nonpoint/implementation.htm> (last visited Nov. 11, 2014), archived at perma.cc/DN3J-7ED7.

¹³⁷ *Id.*

¹³⁸ See *id.*; *supra* notes 100-113.

For agricultural nonpoint sources, the Oregon Department of Agriculture's ("ODA") Water Quality Management Program ("WQMP") is responsible for "developing and implementing agricultural pollution prevention and control programs to meet water quality standards, [TMDL] allocations, and to implement Groundwater Management Area . . . action plans affected by agricultural lands."¹³⁹ Specifically, Oregon statutes require the ODA to develop and implement an agricultural water quality management plan whenever (1) a TMDL is established for a particular water body that agricultural sources affect, (2) the state declares a groundwater management area, or (3) state or federal law otherwise requires.¹⁴⁰ The ODA has established thirty-eight agricultural water quality management areas and plans.¹⁴¹

Under the ODA's regulations, agricultural water quality management area plans are "plans that comprehensively outline measures that will be taken to prevent and control water pollution from agricultural activities and soil erosion on agricultural and rural lands located in a management area . . ."¹⁴² Although the ODA prefers to work through voluntary measures, "[e]nforceable mechanisms [are] available to address water pollution problems where voluntary compliance is not achieved."¹⁴³

Most of the rules governing each agricultural water quality management area include at least some enforceable requirements, generally related to maintaining riparian zone buffer areas.¹⁴⁴ In some management plans, however, the requirements for agricultural nonpoint sources are more extensive—although they are often phrased in generalized terms ("minimize" sediment or nutrient) and affected farmers have significant freedom to design their own methods of compliance, making enforcement and assessment of compliance more diffi-

¹³⁹ See *Nonpoint Source Program Implementation*, *supra* note 136.

¹⁴⁰ OR. REV. STAT. § 568.909 (2013).

¹⁴¹ *Agriculture Water Quality Management Areas*, OR. DEP'T OF AGRIC., <http://geo.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=e48e9d32e854458a8079b10852c3100b> (last visited Nov. 11, 2014), *archived* at perma.cc/8N7Z-5W68.

¹⁴² OR. ADMIN. R. 603-090-0000(3) (2014).

¹⁴³ *Id.* at 603-090-0000(5). As ODA itself reported in its 2012 Agricultural Water Quality Report, it does exercise this enforcement authority (albeit mostly in response to complaints), although rarely at the "formal" enforcement levels of Notices of Noncompliance and civil penalties—instead, most of its enforcement actions consist of letters of compliance, water quality advisories, and letters of warning. OR. DEP'T OF AGRIC., OREGON AGRICULTURAL WATER QUALITY REPORT 20–21 (2012), *available* at <http://www.oregon.gov/ODA/shared/Documents/Publications/NaturalResources/ORAgWaterQualityReport.pdf>, *archived* at <http://perma.cc/V26K-9FRM>. There is, however, some evidence that the ODA is stepping up its enforcement efforts, especially along waterways with the worst water quality problems. Scott Learn, *Oregon Farm Pollution Act Goes Under the Spotlight*, OREGONIAN (Oct. 16, 2012, 11:41 AM), http://www.oregonlive.com/environment/index.ssf/2012/10/oregons_landmark_farm_pollutio.html, *archived* at <http://perma.cc/UP73-R5CA>.

¹⁴⁴ See, e.g., OR. ADMIN. R. 603-090-0540(1)(a)(B), (7)(a).

cult.¹⁴⁵ In the Coos and Coquille Agricultural Management Area,¹⁴⁶ for example, the following requirements apply:

- (2) Sediment Management
 - (a) Effective three years after rule adoption, soil erosion associated with agricultural cultivation shall not deliver sediment sufficient to violate water quality standards.
- (3) Nutrient Management
 - (a) Effective three years after rule adoption, application and storage of manure, commercial fertilizer, and other added nutrient inputs to agricultural lands will be done in a manner that minimizes the introduction of nutrients into waterways.
- (4) Pesticide Management
 - (a) Effective three years after rule adoption, in cranberry production, water storage systems that intercept agricultural drainage containing pesticides and that reapply this water will be designed to minimize percolation of drainage waters to groundwater or overflow of the impoundment to surface waters.
- (5) Riparian Management
 - (a) Effective three years after rule adoption, management activities in the riparian area will be conducted in a manner that allows the establishment, growth, and maintenance of riparian vegetation consistent with vegetative site capability so as to provide some combination of filtering capacity, sediment trapping, stream bank stability, and shade.¹⁴⁷

Similarly, the Umatilla management plan¹⁴⁸ contains several sets of requirements, including:

- (5) Livestock Management
 - (a) Pastures and rangeland must be managed to prevent sediment, nutrient and bacterial contributions to waters of the state. Adequate vegetative buffers or filter strips must be installed and maintained, and vegetative cover must be maintained or restored after

¹⁴⁵ See, e.g., *id.* at 603-095-1520(1).

¹⁴⁶ *Id.* (noting that the area is “[c]omprised of the Coos and Coquille drainages, the Tenmile drainage, the Twomile drainage, and Fourmile drainage (including the headwaters of the South Fork Fourmile Creek), and those lands within Coos County that lie north of the county line west of its junction with the Bethel Mountain Road”).

¹⁴⁷ *Id.* at 603-095-1540(2)–(5).

¹⁴⁸ OR. ADMIN. R. 603-095-0320(1) (2014) (“The Umatilla Agricultural Water Quality Management Area includes all land that drains into the Umatilla River and all land in Oregon that drains directly to the Columbia River between the Umatilla River and the Walla Walla River.”).

use as needed to control contaminated runoff or weed infestations. Where appropriate, waste management systems must be installed to collect, store and utilize animal wastes.

(b) Barnyards, feedlots, drylots, confinement and non-pasture areas, and other livestock facilities located near waters of the state must employ an adequate runoff control system, or an equally effective pollution control practice. Where necessary to prevent waste delivery, waste management systems must be installed to collect, store and utilize animal wastes.

(c) Grazing must be done in a manner that does not degrade waters of the state or negatively impact the stability of streambanks. Grazing management systems must be applied that allow for recovery of plants and leaves adequate vegetative cover to ensure streambank stability, reduce sediments.

....

(7) Nutrient and Farm Chemical Management

(a) Crop nutrient applications, including manure, sludge and commercial fertilizers, must be done at a time and in a manner that does not pollute waters of the state.

(b) Nutrients and farm chemicals must be stored in a location and condition that makes them unlikely to be carried into the waters of the state by any means.¹⁴⁹

In general, the ODA has become progressively stricter about the mandatory nature of these management plans, imposing more specific requirements on agricultural sources in later-established areas than in the earlier-established areas.¹⁵⁰ This increasing specificity is probably a response to both increasing pressures from environmental groups and an increasing recognition on behalf of the ODA that specific requirements make both compliance and enforcement easier.¹⁵¹

c. Wisconsin

Wisconsin agricultural products sent to market in 2012 were valued at over \$12 billion, much of which came from livestock, dairy (Wisconsin milk

¹⁴⁹ *Id.* at 603-095-0340(5), (7).

¹⁵⁰ See Learn, *supra* note 143.

¹⁵¹ See *id.*

alone was worth \$5.23 billion in 2012), and poultry.¹⁵² Wisconsin, however, also has a significant commitment to outdoor recreation, and the state's Department of Natural Resources produces extensive five-year State Comprehensive Outdoor Recreation Plans¹⁵³ in order to qualify for funding under the Federal Land and Water Conservation Fund Act of 1965.¹⁵⁴ The latest of these reports emphasizes that eighty-seven percent of Wisconsin residents enjoy some form of outdoor recreation and that sizeable percentages of the Wisconsin population participate in activities that directly depend on Wisconsin's freshwater resources.¹⁵⁵ The Outdoor Recreation Plan concludes that "[w]ater-based outdoor activities are among the most popular recreation activities in Wisconsin."¹⁵⁶

The Wisconsin Department of Natural Resources has emphasized that "[w]ater resources are the foundation for Wisconsin's economy, environment and quality of life."¹⁵⁷ It has also explicitly connected agricultural nonpoint source pollution to impacts on public recreation, noting that these impacts include "[a]lgae blooms, lower oxygen levels, and larger plants [that] hurt the life that lives in our water. It also harms water habitats, ruins the natural beauty, and can prevent us from using our lakes, streams and rivers for recreation."¹⁵⁸ Undergirding the public interest in water recreation, Wisconsin also

¹⁵² NAT'L AGRIC. STATISTICS SERV., U.S. DEP'T OF AGRIC., 2013 WISCONSIN AGRICULTURAL STATISTICS 1 (2013), available at http://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/Annual_Statistical_Bulletin/bulletin2013_web.pdf, archived at perma.cc/CL9-STDL.

¹⁵³ See, e.g., JEFFREY PREY ET AL., WIS. DEP'T OF NATURAL RES., THE 2011–2016 WISCONSIN STATEWIDE COMPREHENSIVE OUTDOOR RECREATION PLAN, at vii–viii, available at http://dnr.wi.gov/topic/parks/planning/scorp/pdfs/WI_SCORP_2011_16.pdf, archived at perma.cc/R46A-URF5.

¹⁵⁴ Land and Water Conservation Fund Act of 1965 (LWCFA), 16 U.S.C. § 460l-8(d) (2012). The latest of these reports emphasizes that eighty-seven percent of Wisconsinites enjoy some form of outdoor recreation. PREY ET AL., *supra* note 153, at 2-2. Activities that directly depend on Wisconsin's freshwater resources are beaches (42.3%), swimming in lakes and streams (41.7%), freshwater fishing (37.4%), motor boating (36%), warm-water fishing (33.2%), fish viewing and photography (26.7%), and visiting non-beach watersides (22.6%). *Id.* at 2-3. One can also safely assume that a variety of the other popular recreational activities, such as walking for pleasure (87.7%), outdoor scenic viewing and photography (65.3%), wildlife (57.9%) and plant (52.4%) viewing and photography, sightseeing (50.6%), picnicking (47.0%), birdwatching and bird photography (41.7%), and day hiking (36.7%) also often involve Wisconsin's plentiful rivers, lakes, and streams. *Id.*

¹⁵⁵ PREY ET AL., *supra* note 153, at 2-6.

¹⁵⁶ *Id.*

¹⁵⁷ *Water Topics*, WIS. DEP'T OF NATURAL RES., <http://dnr.wi.gov/topic/water.html> (last updated July 19, 2013), archived at <http://perma.cc/M5FW-7HZ5>.

¹⁵⁸ *Environmental Impacts of Agricultural Runoff*, WIS. DEP'T OF NATURAL RES., <http://dnr.wi.gov/topic/Nonpoint/AgEnvironmentalImpact.html> (last updated Nov. 11, 2014), archived at <http://perma.cc/L5L5-Z66R>.

has a strong public trust doctrine that gives the public extensive legal rights in these resources.¹⁵⁹

Thus, Wisconsin's move to regulate agricultural nonpoint source pollution derives from the strong countervailing public interest in recreation and other public uses of waterways that could become contaminated by agriculture and other nonpoint sources.¹⁶⁰ In October 2000, after years of relying on voluntary nonpoint source control measures, the Wisconsin Department of Natural Resources implemented a mandatory nonpoint source control program.¹⁶¹ The program is designed to ensure that all Wisconsin waters meet water quality standards.¹⁶²

Under the agriculture provisions of this mandatory program, Wisconsin imposes different pollution control measures on different types of farms.¹⁶³ For example, farmers growing agricultural crops must prevent topsoil loss and must rely on a nutrient management plan to limit nutrient overloading of the soils, with a goal of reducing nutrient pollution reaching the waterway.¹⁶⁴ The nutrient management plan requirement was phased in over six years.¹⁶⁵ Implementation, however, has been slower than this schedule suggests.¹⁶⁶ Although progress has been steady, by 2012 only twenty-two percent of Wisconsin's nine million acres of crops were covered by nutrient management plans.¹⁶⁷

¹⁵⁹ Dave Marcouiller & Scott Coggins, *Water as a Public Good: Property Rights*, in 3 WATER ISSUES IN WISCONSIN 1999, at 1 (Univ. of Wis. Extension, Water Issues in Wisconsin Ser. No. G3698-3), available at http://www.fred.ifas.ufl.edu/conservation-webinars/Wisconsin-G3698_3.pdf, archived at perma.cc/Z8Q4-B4CZ.

¹⁶⁰ See *id.*

¹⁶¹ WIS. STATE LEG., ORDER OF THE STATE OF WISCONSIN NATURAL RESOURCES BOARD CREATING RULES, CR 00-027 (2002), available at http://docs.legis.wisconsin.gov/code/chr/2000/cr_00_027 (documenting Wisconsin State Legislature Clearinghouse Report 00-027 relating to runoff management), archived at <http://perma.cc/T6A4-X428>.

¹⁶² WIS. ADMIN. CODE NR § 151-001 (2010).

¹⁶³ See generally WIS. DEP'T OF NATURAL RES. ET AL., WISCONSIN'S RUNOFF RULES: WHAT FARMERS NEED TO KNOW (2004) [hereinafter WIS. DEP'T OF NATURAL RES., RUNOFF RULES], available at <http://www.vernoncounty.org/lwcd/documents/farmersNeed.pdf>, archived at perma.cc/THQ4-6UQC.

¹⁶⁴ See *id.*

¹⁶⁵ WIS. ADMIN. CODE NR § 151-07(4)–(6) (2013). New croplands had to comply by October 1, 2003; croplands located near high priority waters—CWA impaired waters, outstanding natural resource waters, source water (drinking water) protection areas—had to comply by January 1, 2005; and all other croplands had to comply by January 1, 2008. *Id.*

¹⁶⁶ See Jane Fyksen, *Nutrient Management Planning: Continued Progress in State*, AGRI-VIEW (Dec. 13, 2012, 11:00 AM), http://www.agriview.com/news/crop/nutrient-management-planning-continued-progress-in-state/article_cc13039a-4491-11e2-ab3a-001a4bcf887a.html, archived at perma.cc/GL2J-AW6W.

¹⁶⁷ *Id.*

Nutrient management plans must be prepared by an agronomist or state-trained farmer and must meet a series of technical requirements, including soil nutrient tests.¹⁶⁸ Under Wisconsin's rules, farmers who raise, feed, or house livestock must: (1) prevent direct runoff from feedlots or stored manure into state waters; (2) limit stock access to state waters and reinforce stream banks with sod; and (3) follow a nutrient management plan for manure application.¹⁶⁹ The nutrient management plan is subject to the same requirements as those for crop farmers.¹⁷⁰ Moreover, if the farmer is located in a state Water Quality Management Area,¹⁷¹ the farmer must not stack manure in unconfined piles and must divert clean water away from feedlots, manure storage areas, and barnyards.¹⁷²

Wisconsin offers cost sharing to farmers to ease compliance with the new requirements.¹⁷³ Indeed, “[i]n most cases, farmers cannot be required to change an existing cropland practice or livestock facility on a farm to meet the new standards, unless they are offered cost sharing. Farmers are eligible for at least [seventy percent] cost sharing—more if there is an economic hardship.”¹⁷⁴ Farmers are also eligible for cost sharing if they voluntarily install other conservation measures to improve water quality or conserve wildlife.¹⁷⁵ Farmers who do not come into compliance with the nonpoint source requirements, however, lose their state Farmland Preservation Tax Credit.¹⁷⁶

2. Summary: States and Nonpoint Source Regulation

As Florida, Oregon, and Wisconsin demonstrate, states that have chosen to actually *regulate* nonpoint sources—especially agricultural nonpoint sources—generally do so in response to specific economic, cultural, or public interests that can counteract the strong political drive in the United States to protect agriculture.¹⁷⁷ The 2012 Environmental Defense Fund study strongly suggests that in the nineteen states with mandatory nonpoint source requirements, these programs are always tied to the aforementioned kinds of countervailing interests—including contamination of drinking water sources.¹⁷⁸

¹⁶⁸ WIS. DEP'T OF NATURAL RES., RUNOFF RULES, *supra* note 163.

¹⁶⁹ WIS. ADMIN. CODE NR § 151-07(3).

¹⁷⁰ *Id.*

¹⁷¹ WIS. DEP'T OF NATURAL RES., RUNOFF RULES, *supra* note 163.

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁷⁴ *Id.*

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ See *supra* notes 90–176 and accompanying text.

¹⁷⁸ CRAIG & NOTO, *supra* note 83, at 6–8, 22–57.

Thus, state identification of important water quality problems caused by nonpoint sources appears to be a key driver of nonpoint source pollution regulation.¹⁷⁹ In many states, the CWA's TMDL process can help identify nonpoint source problems.¹⁸⁰ In others, such as Oregon, the ESA can also underscore certain kinds of water quality problems.¹⁸¹ Finally, all of the more obvious water quality problems associated with nutrient pollution—visible algae growth, eutrophication, and hypoxia (with dead organisms)—can make clear to states like Florida and Wisconsin that agricultural nonpoint source pollution has become a problem.

These observations may be instructive for other nations beginning to deal with nonpoint source, or diffuse source, pollution, like Australia. It is however, always tricky to transport regulatory insights from one country directly into another.¹⁸² To demonstrate these potential difficulties, Part II of this Article examines some key legal and cultural differences between the United States and Australia.¹⁸³

II. DISTINCTIVE FEATURES OF THE U.S. SYSTEM COMPARED TO VICTORIA'S AND QUEENSLAND'S LAWS AND CULTURE

Although the United States and Australia are roughly the same size and share similar settlement histories, there are important legal and cultural differences between the two countries that can affect the enactment and implementation of American-type water quality regulations in Australia.¹⁸⁴ One obvious difference is population.¹⁸⁵ In July 2014, the U.S. Census Bureau estimated that the U.S. population was over 318.5 million people, making the United States the third most populated country, after China and India.¹⁸⁶ In contrast, in July 2014, the Australia Bureau of Statistics estimated that Australia had slightly over 23.5 million people—more than an order of magnitude smaller than the United States.¹⁸⁷ Although the populations of neither country are evenly distributed, it is nevertheless fair to expect that people in the United

¹⁷⁹ See, e.g., *supra* notes 95–101 and accompanying text.

¹⁸⁰ See, e.g., *supra* note 110 and accompanying text.

¹⁸¹ See *supra* notes 128–129 and accompanying text.

¹⁸² See, e.g., Nelson, *Regulating Nonpoint Source Pollution in the US*, *supra* note 14, at 341–42.

¹⁸³ See *infra* notes 184–281 and accompanying text.

¹⁸⁴ See *infra* notes 185–281 and accompanying text.

¹⁸⁵ Compare *U.S. and World Population Clock*, U.S. CENSUS BUREAU, <http://www.census.gov/popclock/> (last visited Nov. 11, 2014), archived at <http://perma.cc/WHT4-A4SJ>, with *Population Clock*, AUSTRALIAN BUREAU OF STATISTICS, <http://www.abs.gov.au/ausstats/abs%40.nsf/94713ad445ff1425ca25682000192af2/1647509ef7e25faaca2568a900154b63?OpenDocument> (last updated Sept. 24, 2014), archived at <http://perma.cc/94DX-TEK6>.

¹⁸⁶ *U.S. and World Population Clock*, *supra* note 185.

¹⁸⁷ *Population Clock*, *supra* note 185.

States place a more obvious strain on their water resources than people in Australia.¹⁸⁸ As one example particularly relevant to the Clean Water Act (CWA), Australians have never experienced the phenomenon of industrial rivers so polluted that they could catch on fire, a recurring event in late-19th- and early-20th-century America.¹⁸⁹

Other differences between the two countries are also important to a comparison of their laws regulating water quality. This Part surveys six of the most important such differences and provides examples of how key legal features have been important to nonpoint source regulation in the United States.¹⁹⁰

A. Overlapping Jurisdiction Between the Federal and State Governments

The Commonwealth of Australia is a federal constitutional monarchy under a parliamentary democracy.¹⁹¹ Its Constitution provides for the Commonwealth Government's legislative powers and describes thirty-nine heads of power under which the Parliament has the power to make laws.¹⁹² Powers not included in these provisions or in the residual powers granted to the Commonwealth in Section 51 of the Australian Constitution remain with the states.¹⁹³ Analogous to the United States's system of "cooperative federalism,"¹⁹⁴ the states may enact legislation respecting subjects covered in Section 51, but the legislation will be ineffective if inconsistent with or in a field "covered by" Commonwealth legislation.¹⁹⁵

Environmental legislation is not covered in Section 51.¹⁹⁶ As a result, the national government (the Commonwealth) plays only a minor role in water quality regulation, except where serious interstate or trans-boundary problems arise, as in the Murray-Darling Basin.¹⁹⁷ The Commonwealth generally uses its

¹⁸⁸ Jonathan H. Adler, *The Fable of the Burning River, 45 Years Later*, WASH. POST (June 22, 2014), <http://www.washingtonpost.com/news/volokh-conspiracy/wp/2014/06/22/the-fable-of-the-burning-river-45-years-later/>, archived at <http://perma.cc/3S8T-CGDE>.

¹⁸⁹ *Id.*

¹⁹⁰ See *infra* notes 191–281 and accompanying text.

¹⁹¹ Commonwealth of Australia Act, 1900 (Imp), 63 & 64 Victoria, c. 12, § 9 (U.K.).

¹⁹² AUSTRALIAN CONSTITUTION S 51.

¹⁹³ DEP'T OF HOUSE OF REPRESENTATIVES, PARLIAMENT OF AUSTL., HOUSE OF REPRESENTATIVES PRACTICE 16 (I.C. Harris et al. eds., 5th ed. 2006), available at <http://www.aph.gov.au/binaries/house/pubs/practice/5ch01.pdf>, archived at <http://perma.cc/KHS3-A3KA>.

¹⁹⁴ See *infra* note 202 and accompanying text.

¹⁹⁵ DEP'T OF HOUSE OF REPRESENTATIVES, *supra* note 193, at 16; see AUSTRALIAN CONSTITUTION S 109.

¹⁹⁶ Emily Collett, *Federalism—Frequently Asked Questions*, GILBERT & TOBIN CTR. FOR PUB. LAW, UNIV. NEW S. WALES AUSTL., <http://www.gtcentre.unsw.edu.au/resources/federalism/frequently-asked-questions> (last visited Nov. 12, 2014), archived at <http://perma.cc/ZY5W-H6VS>.

¹⁹⁷ *Basin Plan*, MURRAY-DARLING BASIN AUTH., <http://www.mdba.gov.au/what-we-do/basin-plan> (last visited Nov. 12, 2014), archived at <http://perma.cc/JQ4Q-5TWS>. The Murray-Darling Basin

powers granted in the Environment Protection and Biodiversity Conservation Act 1999 (“EPBC” Act) when actions are likely to have impacts in one or more of nine areas considered to be areas of national environmental significance.¹⁹⁸ Thus, if the political will to address a particular water quality problem does not exist within the state government, there is unlikely to be an external governmental impetus to address it.¹⁹⁹

In contrast, in the United States, the states and the federal government overlap far more in regulatory authority, and particularly where environmental matters are concerned, allowing multiple levels of government to address the same problems.²⁰⁰ For example, although U.S. federal law displaces state law when Congress commands or when the two directly conflict,²⁰¹ the interaction of state and federal power allows for arrangements such as the CWA’s “cooperative federalism.”²⁰² States must always be mindful of Environmental Protection Agency (EPA) approval points,²⁰³ such as for water quality standards and total maximum daily loads (“TMDLs”),²⁰⁴ and of the EPA’s authority to take over a state permitting process²⁰⁵ or to “overfile” a state enforcement action.²⁰⁶ Conversely, the EPA is often content to leave enforcement of minor or routine violations of the CWA to the states, thus sharing the budgetary burden

affects four states and the Australia Capital Territory, and water quality issues in the basin are now governed by the Murray-Darling Basin Authority under the authority of the federal Water Act 2007. *Id.*; see *Water Act 2007* (Cth) (Austl.), available at <http://www.comlaw.gov.au/Details/C2014C00715>, archived at <http://perma.cc/U9R4-GU4M>.

¹⁹⁸ *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (Austl.); see *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), AUSTL. GOV’T DEP’T OF ENV’T, <http://www.environment.gov.au/topics/about-us/legislation/environment-protection-and-biodiversity-conservation-act-1999> (last visited Nov. 12, 2014), archived at <http://perma.cc/7X5T-6XRR>. The nine areas of federal government intervention are: world heritage properties, national heritage places, wetlands of international importance, listed threatened species and ecological communities, migratory species, Commonwealth marine areas, Great Barrier Reef Marine Park, nuclear actions (including uranium mines), and a water resource in relation to a coal seam gas development and large coal mining development. *What Is Protected Under the EPBC Act?*, AUSTL. GOV’T DEP’T OF ENV’T, <http://www.environment.gov.au/epbc/what-is-protected> (last visited Nov. 12, 2014), archived at <http://perma.cc/G6EM-7GH4>.

¹⁹⁹ See, e.g., Nelson, *Regulating Nonpoint Source Pollution in the US*, *supra* note 14, at 341.

²⁰⁰ See Jonathan H. Adler, *When Is Two a Crowd? The Impact of Federal Action on State Environmental Regulation*, 31 HARV. ENVTL. L. REV. 67, 85 (2007).

²⁰¹ U.S. CONST. art. VI, cl. 2 (the Supremacy Clause).

²⁰² E.g., Adler, *supra* note 200, at 87 n.89. Cooperative federalism is when the two levels of government share regulatory and enforcement responsibilities, but where federal law establishes minimum or “floor” protections that the states must achieve or exceed with more stringent regulations. *Id.*

²⁰³ See 33 U.S.C. § 1313(a) (2012).

²⁰⁴ See *id.* § 1313(a), (d).

²⁰⁵ See *id.* § 1342(d).

²⁰⁶ See *id.* § 1319(a).

of enforcement.²⁰⁷ Although there are complex and potentially expensive situations that both levels of government actively avoid—for example, the Mississippi River Basin and its impact on the Gulf of Mexico²⁰⁸—the two levels of government have also come together to try to address certain major water quality problems for which there has been strong public interest.²⁰⁹

The Chesapeake Bay is an apt example in the United States of how overlapping federal and state authority under the CWA has induced states to strengthen their management and regulation of nonpoint sources.²¹⁰ The EPA threatened to develop a federal TMDL for the Chesapeake Bay, prompting states around the Bay to step up their cooperative efforts to reduce nitrogen, phosphorus, and sediment loads into the Bay.²¹¹ After twenty-five years of trying, the states had clearly failed to make sufficient progress toward water quality improvements.²¹² In response, on December 29, 2010, the EPA promulgated the Chesapeake Bay TMDL, covering the 64,000-square-mile watershed and affecting Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia.²¹³

Almost twenty-five percent of the land in the Chesapeake Bay watershed is used for agriculture, and “agriculture is also the single largest source of nutrient and sediment pollution entering the Bay.”²¹⁴ To meet their obligations under the TMDL, it was imperative that the Chesapeake Bay states strengthen their agricultural nonpoint source programs.²¹⁵ Virginia, for example, adopted a Chesapeake Bay and Virginia Waters Cleanup Plan in 2006, and in 2013, the

²⁰⁷ See John P. Dwyer, *The Role of State Law in an Era of Federal Preemption: Lessons from Environmental Regulation*, 60 LAW & CONTEMP. PROBS. 203, 216 (1997).

²⁰⁸ See COMM. ON MISS. RIVER & CLEAN WATER ACT, NAT'L RESEARCH COUNCIL, MISSISSIPPI RIVER WATER QUALITY AND THE CLEAN WATER ACT: PROGRESS, CHALLENGES, AND OPPORTUNITIES 5 (2008), available at http://www.nap.edu/catalog.php?record_id=12051 (available for free download at The National Academies Press) (characterizing the Mississippi River and Gulf of Mexico as “orphan” water quality problems).

²⁰⁹ About CERP: *Brief Overview*, COMPREHENSIVE EVERGLADES RESTORATION PLAN, http://www.evergladesplan.org/about/about_cerp_brief.aspx (last visited Nov. 12, 2014), archived at <http://perma.cc/TQW4-TCQ4>; Chesapeake Bay TMDL, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/chesapeakebaytmdl/> (last visited Nov. 12, 2014), archived at <http://perma.cc/5LL4-BBP2>.

²¹⁰ See e.g., *Chesapeake Bay and Virginia Waters Cleanup Plan*, *supra* note 10.

²¹¹ *Chesapeake Bay TMDL*, *supra* note 209.

²¹² *Id.*

²¹³ See U.S. ENVTL. PROT. AGENCY & CHESAPEAKE BAY PROGRAM, FACT SHEET: CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD (TMDL) 1 (2013), available at http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/BayTMDLFactSheet8_26_13.pdf, archived at <http://perma.cc/HUV3-476C>. Like all TMDLs, the Chesapeake Bay TMDL sets total limits on the problematic pollutants—nitrogen, phosphorus, and sediment—and it divides those pollutant loads by watershed among the relevant states and the District of Columbia. *Id.*

²¹⁴ *Agriculture*, CHESAPEAKE BAY PROGRAM, <http://www.chesapeakebay.net/issues/issue/agriculture> (last visited Nov. 12, 2014), archived at <http://perma.cc/DT2Y-4EL8>.

²¹⁵ See *infra* notes 216–219 and accompanying text.

state began incorporating it into Virginia's general nonpoint source management plan.²¹⁶ The state released a new draft Nonpoint Source Management Plan in late June 2014, which included its projected reductions to comply with the Chesapeake Bay TMDL.²¹⁷ Another pertinent example is Maryland, which proudly announced in June 2014 that it met the 2012–2013 pollutant reduction milestones under the Chesapeake Bay TMDL.²¹⁸ To meet these goals, the state implemented several new measures to limit agricultural pollution, including: (1) revised nutrient management regulations that became effective in October 2012; (2) finalized implementation of the state's new Fertilizer Act; (3) more extensive use of cover crops; (4) improved re-distribution of excess fertilizer; (5) increased use of forest and streamside buffers; (6) and improvements to the Phosphorus Management Tool.²¹⁹

It is far too early to tell whether the Chesapeake Bay TMDL will ultimately be successful, in terms of either continued state implementation for the time period necessary *or* actual water quality improvements in the Bay. Nevertheless, the Chesapeake Bay TMDL experience demonstrates that overlapping federal and state water quality authority can prompt or induce new state laws and management policies to address nonpoint source pollution—an option that largely does not exist in Australia.²²⁰

B. Source-Based, Rather Than Water Quality-Based Regulation and Enforcement

One of the most important aspects of water quality regulation in the United States is that Congress consciously rejected a water quality-based regulatory scheme in the CWA in favor of a source-based regulatory scheme.²²¹ Congress did so after several decades of frustration with water quality-based regimes focused on ambient water quality targets, and it explicitly noted that enforcement under such regimes is nearly impossible because of the difficulties of linking a particular source to a particular water quality problem.²²² Although

²¹⁶ VA. DEP'T OF ENVTL. QUALITY, VIRGINIA NONPOINT SOURCE POLLUTION MANAGEMENT PROGRAM PLAN 6–11 (2014), *available at* http://www.deq.virginia.gov/Portals/0/DEQ/Water/NonpointSource/NPSPlan/VA2014NPS-EPA_Submitted09302014.pdf, *archived at* <http://perma.cc/L7M5-8V6M>.

²¹⁷ *Id.* at 40–41.

²¹⁸ Press Release, Md. Dep't of Env't, Maryland Achieved 2012–2013 Pollutant Reduction Targets for Bay Restoration (June 26, 2014) (on file with author), *available at* <http://news.maryland.gov/mde/2014/06/26/maryland-achieved-2012-2013-pollution-reduction-targets-for-bay-restoration/>, *archived at* <http://perma.cc/Z3JT-HYVK>.

²¹⁹ *Id.*

²²⁰ *See supra* notes 210–219 and accompanying text.

²²¹ CRAIG, *supra* note 26, at 10–27.

²²² *See id.* (discussing the history of federal water quality regulation in the United States).

the CWA retains goals for ambient water quality,²²³ its regulatory focus, as noted, is to impose discharge requirements on particular polluters.²²⁴ Similarly, when U.S. states have adopted enforceable regulatory programs for nonpoint sources, they have tended to take the same approach, requiring particular sources to implement one or more specific best management practices (“BMPs”) and basing enforcement on the source’s implementation of those practices.²²⁵

In contrast, the Australian states of Victoria and Queensland have taken two distinct approaches to water quality regulation.²²⁶ Victoria currently remains fixated on ambient water quality and pollution reduction targets,²²⁷ and suffers from all of the enforcement frustrations that drove the U.S. Congress to reject this approach.²²⁸ The state’s water quality programs would benefit tremendously from a similar incorporation of source-focused requirements.²²⁹ Queensland, in contrast, has adopted a hybrid approach in its initial steps to protect the Great Barrier Reef from diffuse water pollution.²³⁰ Whereas Queensland legislation still sets targets for ambient water quality, the Queensland Department of Environment and Resource Management has taken the first steps in imposing enforceable requirements on individual sources of pollution.²³¹ The Great Barrier Reef protection legislation is part of Queensland’s Chemical Usage Act 1988 and Environmental Protection Act 1994.²³² For all of the same reasons that source-based regulatory approaches worked in the United States, adopting a source-based approach in Queensland is likely to be more successful.²³³

²²³ 33 U.S.C. § 1313(a) (2012).

²²⁴ *Id.* §§ 1311(a), 1362(12), 1362(14) (meaning to facilitate much easier enforcement).

²²⁵ CRAIG & NOTO, *supra* note 83, at 6–8, 22–57.

²²⁶ See CRAIG, *supra* note 26, at 10–27; *infra* notes 282–467 and accompanying text.

²²⁷ See *infra* notes 282–467 and accompanying text.

²²⁸ See CRAIG, *supra* note 26, at 10–27; *infra* notes 282–467 and accompanying text.

²²⁹ CRAIG, *supra* note 26, at 10–27; *infra* notes 282–467 and accompanying text.

²³⁰ *Great Barrier Reef Protection Amendment Act 2009* (Qld) (Austl.), available at <https://www.legislation.qld.gov.au/LEGISLTN/ACTS/2009/09AC042.pdf>, archived at <http://perma.cc/79NV-JDF3>; CRAIG, *supra* note 25, at 10–27.

²³¹ See *Great Barrier Reef Protection Amendment Act 2009* (Qld) (Austl.); CRAIG, *supra* note 26, at 10–27.

²³² *Great Barrier Reef Protection Amendment Act 2009* (Qld) (Austl.).

²³³ See *supra* notes 221–225.

C. A Mechanism for Linking Point Sources to Nonpoint Sources to Meet Overall Water Quality Goals

The CWA's TMDL mechanism links point sources and nonpoint sources for water bodies where the water quality is impaired.²³⁴ Each TMDL thus creates incentives for point sources to encourage their state legislatures and water quality agencies to more actively and effectively address nonpoint source pollution and to work with nonpoint sources to reduce their contributions to water quality impairments.²³⁵ In addition, the TMDL process has forced many states to acknowledge that for many water bodies, water quality impairments arise either exclusively or primarily through nonpoint source pollution.²³⁶ This recognition provides another incentive for states to strengthen their nonpoint source management programs.²³⁷

The TMDL requirement has also provided incentives for more creative water quality improvement mechanisms.²³⁸ For example, in watersheds with TMDLs for nutrients or sediments, the EPA allows water quality trading among all sources.²³⁹ The potential advantages of water quality trading for agricultural nonpoint sources is becoming widely recognized, and the U.S. Department of Agriculture has recently decided to promote it to farmers.²⁴⁰ In addition, nutrient trading is being pursued in the Chesapeake Bay region—primarily in Virginia and Pennsylvania—to encourage nonpoint sources to reduce nutrient pollution.²⁴¹ Integrated watershed water management approaches, like those adopted by the state of Texas, are also emerging.²⁴²

²³⁴ See 33 U.S.C. § 1313(d) (2012) (meaning federal established water quality standards are not met).

²³⁵ See Williams, *supra* note 4, at 121.

²³⁶ See *supra* notes 75–183 and accompanying text.

²³⁷ See *supra* notes 75–183 and accompanying text. As discussed, Florida, Oregon, and Wisconsin all use their nonpoint source programs at least in part to address TMDLs within the state. See *supra* notes 75–183 and accompanying text.

²³⁸ See *supra* notes 75–183 and accompanying text.

²³⁹ *Final Water Quality Trading Policy*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/type/watersheds/trading/finalpolicy2003.cfm> (last updated Mar. 6, 2012), archived at <http://perma.cc/LRY7-BNKU>.

²⁴⁰ See CONSERVATION TECH. INFO. CTR., GETTING PAID FOR STEWARDSHIP: AN AGRICULTURAL COMMUNITY WATER QUALITY TRADING GUIDE 5 (2006), available at [http://www.conservationinformation.org/media/users/lvollmer/pdf/GPFS_final\(1\).pdf](http://www.conservationinformation.org/media/users/lvollmer/pdf/GPFS_final(1).pdf), archived at <http://perma.cc/8P9R-5MXK>; Press Release, U.S. Env'tl. Prot. Agency, USDA, EPA Partnership Supports Water Quality Trading to Benefit Environment, Economy (Dec. 3, 2013) (on file with author), available at <http://yosemite.epa.gov/opa/admpress.nsf/ec5b6cb1c087a2308525735900404445/41888687a8e96fdb85257c36005830d4!opendocument>, archived at <http://perma.cc/HH6V-G8UC>.

²⁴¹ CHESAPEAKE BAY FOUND., FACTS ABOUT NUTRIENT TRADING (n.d.), available at <http://www.cbf.org/document.doc?id=141>, archived at <http://perma.cc/M2Q7-2RMW>.

²⁴² See generally TEX. COMM'N ON ENVTL. QUALITY, THE NONPOINT SOURCE POLLUTION PROGRAM (n.d.), available at <https://www.tceq.texas.gov/assets/public/compliance/monops/nps/grants/>

D. Environmental Citizen Suits

Environmental citizen suits are an important enforcement mechanism that can supplement or even drive water quality improvement efforts by states and the federal government.²⁴³ Empirical evidence indicates that citizen suits have always been a significant component of environmental enforcement in the United States, and they can “even out” enforcement in years when, for political or budgetary reasons, federal and state enforcement wane.²⁴⁴

Citizen suits have repeatedly required the enforcement of statutory protections.²⁴⁵ For example, coordinated citizen suits against the EPA in multiple states by various environmental organizations are widely credited with compelling the EPA and the states to implement the CWA’s TMDL requirement.²⁴⁶ In addition, citizen suits helped to drive the reclassification of channeled stormwater as point source pollution, prompting the 1987 Stormwater Amendments to the CWA.²⁴⁷ They have also tested the limits of federal and state responsibilities in other ways regarding nonpoint source pollution under federal law.²⁴⁸

Australian law has not embraced the concept of the citizen suit as broadly as American law has, and more generally, litigation as an enforcement tool is nowhere near as popular in Australia as it is in the United States.²⁴⁹ As a result, Victoria and Queensland—and Australia generally—lack the tripartite en-

TheNPSProgram.pdf, archived at <http://perma.cc/LWR4-XSCU?type=pdf> (noting that they are integrated because Texas has incorporated its water management approach into its nonpoint source management program).

²⁴³ CRAIG, *supra* note 26, at 284–91.

²⁴⁴ *Id.*

²⁴⁵ See *infra* notes 246–250 and accompanying text.

²⁴⁶ *Litigation Status*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/lawsuit.cfm> (last updated Sept. 11, 2013), archived at <http://perma.cc/YFX9-RKU5>.

²⁴⁷ See *e.g.*, *Sierra Club v. Abston Constr. Co.*, 620 F.2d 41, 47 (5th Cir. 1980) (holding that “surface runoff from rainfall, when collected or channeled by coal miners in connection with mining activities, constitutes point source pollution”); *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369, 1370–71 (D.C. Cir. 1977) (holding that the EPA could not exempt point source discharges of stormwater runoff from the National Pollutant Discharge Elimination System (“NPDES”) permit requirement).

²⁴⁸ See *e.g.*, *League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Forsgren*, 309 F.3d 1181, 1185–88 (9th Cir. 2002) (holding that pesticide spraying over water is point source, not nonpoint source pollution); *Pronsolino v. Nastri*, 291 F.3d 1123, 1140–41 (9th Cir. 2002) (holding that the EPA had authority to set TMDLs for a stream polluted only by nonpoint source pollution when the state failed to do so); *Or. Natural Desert Ass’n v. Dombeck*, 172 F.3d 1092, 1093–94 (9th Cir. 1998) (arguing, unsuccessfully, that the U.S. Forest Service needed to obtain a state water quality certification, pursuant to 33 U.S.C. § 1341(a) (2012), before issuing a grazing permit, because cattle grazing caused runoff and other forms of nonpoint source water pollution).

²⁴⁹ DAVID MOSSOP, *CITIZEN SUITS—TOOLS FOR IMPROVING COMPLIANCE WITH ENVIRONMENTAL LAWS 1* (1993), available at http://www.aic.gov.au/media_library/publications/proceedings/26/mossop.pdf, archived at <http://perma.cc/P658-UY5F>.

forcement pressures of federal, state, and citizen awareness and enforcement that drive U.S. environmental law, leaving environmental enforcement—and the pursuit of nonpoint source regulation—almost entirely to the political will and the economic and institutional capabilities of the relevant state agencies.²⁵⁰

E. Countervailing Interests in Water Quality That Are Economically and Politically Important and More Water Quality Conflicts

The American states that have adopted mandatory or even relatively strong nonpoint source management programs have always done so with the impetus of important economic, social, legal, and political pressures in favor of improved water quality.²⁵¹ Such pressures have played a particularly prominent role in passing legislation through which the state imposed enforceable requirements on agriculture, an industry that has a particularly strong national political lobby.²⁵²

In Florida for example, the state's numerous springs—and the manatees and alligators that they shelter—are a vital part of the state's tourism industry and its state identity, but the springs are also extremely sensitive to nutrient pollution.²⁵³ Similarly, the Everglades (which further benefit from federal significance because they are part of a national park) and the coral reefs of the Florida Keys (part of a federally-established National Marine Sanctuary) are sensitive to phosphorus and nitrogen pollution, respectively.²⁵⁴ Contamination

²⁵⁰ *See id.*

²⁵¹ CRAIG, *supra* note 26, at 284–91.

²⁵² *See, e.g.,* Marc-William Palen, *How the Farm Lobby Distorts U.S. Foreign Policy*, FOREIGN POLICY IN FOCUS (Jan. 7, 2011), http://fpif.org/how_the_farm_lobby_distorts_us_foreign_policy/, archived at <http://perma.cc/4TZ6-P7VY> (“Over the past century, the Farm Lobby’s influence on the U.S. government has increased alongside the consolidation and growth of U.S. agribusinesses, the principle recipients of federal farm subsidies.”); Brian M. Riedl, *Agriculture Lobby Wins Big in New Farm Bill*, HERITAGE FOUND. (Apr. 9, 2002), <http://www.heritage.org/research/reports/2002/04/agriculture-lobby-wins-big-in-new-farm-bill>, archived at <http://perma.cc/5CJX-AFKD> (discussing the farm lobby’s efforts with regard to federal legislation).

²⁵³ *Will Florida Save Its Springs or Let Them Die?*, ORLANDO SENTINEL (July 8, 2012), http://articles.orlandosentinel.com/2012-07-08/opinion/os-ed-vanishing-florida-springs-070812-20120706_1_wekiwa-springs-nutrient-pollution-environmental-groups, archived at <http://perma.cc/6TQK-TJQS> (noting not only the nutrient threat to Florida springs but also the fact that “[a] state-commissioned study in 2004 estimated that recreation and tourism associated with Silver Springs added \$61 million a year to the economy and supported more than 1,000 jobs”).

²⁵⁴ *Large Study Shows Pollution Impact on Coral Reefs—and Offers Solution*, *News & Research Communications*, OR. STATE UNIV. (Nov. 26, 2013), <http://oregonstate.edu/ua/ncs/archives/2013/nov/large-study-shows-pollution-impact-coral-reefs-and-offers-solution>, archived at <http://perma.cc/76M5-3QC2>; *Phosphorus Water Quality Standards for the Florida Everglades Factsheet*, U.S. ENVTL. PROT. AGENCY, http://water.epa.gov/lawsregs/rulesregs/floridaeverglades_factsheet.cfm (last updated Mar. 6, 2012), archived at <http://perma.cc/KJN3-5X2L>.

of Florida's coastal waters also interferes with ocean-based tourism, which was worth \$63 billion to Florida in 2005.²⁵⁵

In Oregon, salmon are a politically and economically important resource that also benefit from federal legal protections as a result of the resident Native American tribes' treaty and water rights and the Endangered Species Act (ESA).²⁵⁶ In addition, water-based tourism is important to Oregon's economy generally.²⁵⁷ Similar recreation concerns also help drive water quality improvements in Wisconsin.²⁵⁸

The United States is far more densely populated than most of Australia, and as such, conflicts over water use are more likely to arise in the United States.²⁵⁹ These conflicts help to create political and economic pressure to improve water quality. For example, negative impacts on drinking water quality have been important drivers for more stringent water quality protection all over the United States.²⁶⁰ In particular, contamination of drinking water by nitrates and the resulting risks of "blue baby syndrome" have been an important water quality issue in several states, leading to nitrate standards becoming an enforceable part of the federal Safe Drinking Water Act (SDWA).²⁶¹

²⁵⁵ JULIE HAUSERMAN, *FLORIDA'S COASTAL AND OCEAN FUTURE: A BLUEPRINT FOR ECONOMIC AND ENVIRONMENTAL LEADERSHIP*, at iv-v (2006), available at <http://www.nrdc.org/water/oceans/florida/flfuture.pdf>, archived at <http://perma.cc/ZF5P-G5BV>; *Large Study Shows Pollution Impact on Coral Reefs—and Offers Solution*, supra note 254; *Phosphorus Water Quality Standards for the Florida Everglades Factsheet*, supra note 254.

²⁵⁶ HELVOIGT & CHARLTON, supra note 122, at 1 (estimating that Rogue River salmon in southern Oregon have an annual economic value of \$1.4 million associated with commercial fishing, \$16 million associated with sport fishing, and \$1.5 billion associated with non-use values); *Tribal Salmon Culture*, COLUMBIA RIVER INTER-TRIBAL FISH COMM'N, <http://www.critfc.org/salmon-culture/tribal-salmon-culture/> (last visited Nov. 12, 2014), archived at <http://perma.cc/9XUA-WFA2>.

²⁵⁷ See, e.g., *ODFW Resources: Fishing in Oregon*, OR. DEP'T OF FISH & WILDLIFE, <http://www.dfw.state.or.us/resources/fishing/> (last updated Oct. 3, 2014), archived at <http://perma.cc/PF5D-58L3>; *Rafting: Ride the Rogue, Klamath and Umpqua*, TRAVEL S. OR., <http://southernoregon.org/southern-oregon-rafting?articleTitle=rafting-1253915353-9> (last visited Nov. 12, 2014), archived at <http://perma.cc/JAP3-TWTY>.

²⁵⁸ PREY ET AL., supra note 153, at 2-2.

²⁵⁹ See *Population Growth: International Population Comparison*, AUSTL. BUREAU OF STATISTICS, <http://www.abs.gov.au/ausstats/abs@.nsf/2f762f95845417aeca25706c00834efa/fc53293a72659d82ca2570ec001b074c!OpenDocument> (last updated Feb. 23, 2006), archived at <http://perma.cc/WF3D-WFSV>.

²⁶⁰ See e.g., Robin Erb, *Toledo Drinking-Water Ban Lifted, but Residents Wary*, USA TODAY, (Aug. 4, 2014, 8:51 PM), <http://www.usatoday.com/story/news/nation/2014/08/04/toledo-mayor-says-water-is-safe/13602357/>, archived at <http://perma.cc/CEM8-A7BZ>. Most recently, residents of Ohio lost their drinking water for three days in August of 2014 because of blue-green algae (microcystin) blooms in Lake Erie thought to be "nourished by phosphorous and nitrogen from farm runoff." *Id.*

²⁶¹ *Basic Information About Nitrate in Drinking Water*, U.S. ENVTL. PROT. AGENCY, <http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm> (last updated Feb. 5, 2014), archived at <http://perma.cc/9TAR-8X2R>; see supra note 9 and accompanying text.

Victoria and Queensland have experienced fewer of these water conflicts.²⁶² Notably however, in the places where conflicts have arisen—such as in Melbourne’s Port Phillip Bay,²⁶³ Victoria’s Gippsland Lakes,²⁶⁴ the Murray-Darling Basin,²⁶⁵ and the Great Barrier Reef²⁶⁶—the conflicts appear to produce the same result as in the United States.²⁶⁷ Specifically, when such conflicts occur in Australia, there is a greater impetus for improvements through limit setting—such as caps on water extraction and salt discharges in the case of the Murray Darling Basin and nutrient load reduction targets at the Great Barrier Reef and the Gippsland Lakes—and political discussions about regulation begin to pick up steam.²⁶⁸

F. Forty Years of Regulatory Effort

An important aspect of the American experience with water quality regulation is that it has developed progressively, but slowly, over time.²⁶⁹ Common-law conflicts over water quality date back to at least the end of the nineteenth century.²⁷⁰ In 1899, Congress enacted the Refuse Act provisions of the Rivers and Harbors Act, and in 1948, it enacted the first version of the Federal Water Pollution Control Act.²⁷¹ The contemporary CWA has been in existence for over forty years, and yet there are still both known and emerging water quality problems in the United States that require effective resolution.²⁷² Al-

²⁶² Nelson, *Regulating Nonpoint Source Pollution in the US*, *supra* note 14, at 341–42.

²⁶³ *Stormwater Pollution*, CITY OF PORT PHILLIP, http://www.portphillip.vic.gov.au/stormwater_pollution.htm (last visited Nov. 12, 2014), *archived at* <http://perma.cc/HE4D-Y3AK>.

²⁶⁴ GRAHAM HARRIS, *A DYING SHAME—AUSTRALIAN COASTAL FRESHWATER LAKES 1–4* (2006), *available at* <http://www.environment.gov.au/system/files/pages/ab3ee3b1-f518-47e2-b3f1-e270cf4805ed/files/lakes.pdf>, *archived at* <http://perma.cc/Z3YR-MXNG>.

²⁶⁵ *Water Quality*, MURRAY-DARLING BASIN AUTH., <http://www.mdba.gov.au/river-data/water-quality> (last visited Nov. 12, 2014), *archived at* <http://perma.cc/C5DT-JZ8R>.

²⁶⁶ *Water Quality in the Great Barrier Reef*, GREAT BARRIER REEF MARINE PARK AUTH., <http://www.gbrmpa.gov.au/managing-the-reef/how-the-reefs-managed/water-quality-in-the-great-barrier-reef> (last visited Nov. 12, 2014), *archived at* <http://perma.cc/MKZ2-Z9LK>.

²⁶⁷ *See supra* notes 25–183 and accompanying text.

²⁶⁸ *See infra* notes 282–521 and accompanying text.

²⁶⁹ *See Missouri v. Illinois*, 180 U.S. 208, 209–10 (1901).

²⁷⁰ *Id.*

²⁷¹ 33 U.S.C. § 407 (2012) (original version at ch. 425, § 13, 30 Stat. 1152 (1899)); Federal Water Pollution Control Act of 1948, 33 U.S.C. §§ 1251–1387 (2012) (original version at Pub. L. No. 80-845, 62 Stat. 1155 (1948)).

²⁷² *Pharmaceuticals and Personal Care Products (PPCPs)*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/ppcp/> (last updated Feb. 29, 2012), *archived at* <http://perma.cc/HZP9-CSFM>.

though there is little doubt that overall national water quality has improved, there is also no doubt that much remains to be done.²⁷³

Two other notable aspects of the U.S. experience include the seizing of fortuitous political moments to push through legal mechanisms that force water quality improvements and the lasting strength of those legal mechanisms even where political will later falters. The CWA, for example, was enacted with bipartisan support for environmental regulation in the 1970s that was strong enough that Congress was able to override then President Richard Nixon's veto.²⁷⁴ Although that bipartisan support has since evaporated, there has never been sufficient political support for Congress to repeal the CWA.²⁷⁵

Australian states, in contrast, are at the nascent stages of implementing regulatory water quality protections.²⁷⁶ Time and budgetary constraints make it unrealistic to expect that they will tackle all water quality issues all at once.²⁷⁷ Instead, they are likely to build water quality regulation progressively in response to new conflicts and problems, increasing public demand, and political opportunities in an analogous way to the U.S. experience over the past century.²⁷⁸

In particular, in Australia—as in the United States—both human needs and agricultural interests almost always trump environmental needs.²⁷⁹ The short-term distinction between human, agricultural, and environmental needs, however, becomes illusory in the long run, underscoring the need for regulation and accountability.²⁸⁰ Moreover, although the political forces of the agriculture lobby in Australia are less influential than those in the United States, the lobby nonetheless mounts the same kind of resistance as the U.S. agriculture lobby to any attempt to regulate agricultural water pollution.²⁸¹

²⁷³ Russell McLendon, *Clean Water Act Is 40 Years Old: Landmark Water Law Hits a Milestone During Critical Time*, HUFFINGTON POST (Sept. 11, 2012, 4:57 PM), http://www.huffingtonpost.com/2012/09/11/clean-water-act-2012_n_1874980.html, archived at <http://perma.cc/L9T7-V86E>.

²⁷⁴ Annie Snider, *Clean Water Act: Vetoes by Eisenhower, Nixon Presaged Today's Partisan Divide*, GREENWIRE (Oct. 18, 2012), <http://www.eenews.net/stories/1059971457>, archived at <http://perma.cc/X7E4-QTGP>.

²⁷⁵ McLendon, *supra* note 273.

²⁷⁶ See Nelson, *Regulating Nonpoint Source Pollution in the US*, *supra* note 14, at 341–42.

²⁷⁷ See *infra* note 278 and accompanying text.

²⁷⁸ See CRAIG, *supra* note 26, at 284–91.

²⁷⁹ See Rebecca L. Nelson, *Legislation for ICM: Advanced Water Resources Sustainability*, 22 ENVTL. PLANNING & L.J. 96–97, 99, 128 (2005) [hereinafter Nelson, *Legislation for ICM*].

²⁸⁰ Nelson, *Regulating Nonpoint Source Pollution in the US*, *supra* note 14, at 341 n.5, 342.

²⁸¹ See *id.*

III. REGULATING NONPOINT SOURCE POLLUTION IN VICTORIA

A. The Drive Toward Water Quality Regulation and the Regulatory Structure in the State of Victoria

The state of Victoria, inhabited by 5.7 million people, is located on the southeastern tip of the Australian continent and has significant water amenities.²⁸² These include the Yarra River, which flows through Melbourne and empties into Port Phillip Bay; the Gippsland Lakes in the eastern part of the state, which form the largest series of inland waterways in Australia; and the Murray River in the northern part of the state, which flows for over 1500 miles and constitutes most of the border between Victoria and New South Wales.²⁸³

Many important water bodies in Victoria are starting to experience significant water quality problems as a result of nonpoint source pollution—in particular, pollution from Victoria’s extensive livestock (dairy in particular, and also beef and sheep) farms.²⁸⁴ Victoria also has periodic water quality issues in hotspots such as the Gippsland Lakes, Corner Inlet, Melbourne’s Port Phillip and Western Port Bays, and Lake Corangamite.²⁸⁵ Further, many coastal and inland rivers have regularly failed to meet water quality guidelines since at least 1998, and groundwater nitrate pollution is also emerging in some areas as a result of surface eutrophication problems.²⁸⁶ Although a number of agricul-

²⁸² *Australian Demographic Statistics, Mar 2014*, AUSTL. BUREAU OF STATISTICS, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3101.0> (last updated Sept. 25, 2014), archived at <http://perma.cc/V5FK-TAFS>.

²⁸³ *Gippsland Lakes*, VISITVICTORIA.COM, <http://www.visitvictoria.com/Regions/Gippsland/Activities-and-attractions/Nature-and-wildlife/Lakes-and-waterways> (last visited Nov. 13, 2014), archived at <http://perma.cc/VB8R-RWCH>; *Lakes & Waterways*, VISITVICTORIA.COM, <http://www.visitvictoria.com/Activities-and-attractions/Nature-and-wildlife/Lakes-and-waterways> (last visited Nov. 13, 2014), archived at <http://perma.cc/5ZUE-P3NV>; *The Murray River*, VISITVICTORIA.COM, <http://www.visitvictoria.com/Regions/The-Murray/Activities-and-attractions/Nature-and-wildlife/The-Murray-River> (last visited Nov. 13, 2014), archived at <http://perma.cc/M3U5-L3D4>.

²⁸⁴ *Western Victoria*, DAIRY AUSTL. <http://www.dairyaustralia.com.au/Industry-information/Dairy-regions/Western-Victoria.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/M7D9-W2WV>.

²⁸⁵ MICHELLE DICKSON ET AL., W. GIPPSLAND CATCHMENT MGMT. AUTH., CORNER INLET WATER QUALITY IMPROVEMENT PLAN 2013, at 4, 30–31 (2013), available at http://www.wgcm.vic.gov.au/images/stories/PDF/Programs/CORNER_INLET/corner-inlet-wqipweb.pdf, archived at <http://perma.cc/R5HS-DCYH>; A.M. Ridley et al., *Legume-Based Farming in Southern Australia: Developing Sustainable Systems to Meet Environmental Challenges*, 36 SOIL BIOLOGY & BIOCHEMISTRY 1213, 1217 (2004); Anna M. Roberts et al., *Agricultural Land Management Strategies to Reduce Phosphorus Loads in the Gippsland Lakes, Australia*, 106 AGRIC. SYS. 11, 12 (2012) [hereinafter Roberts et al., *Agricultural Land Management Strategies*]; *Algal Blooms in Port Phillip Bay*, VICT. DEP’T OF ENV’T & PRIMARY INDUS., <http://www.depi.vic.gov.au/environment-and-wildlife/environmental-partnerships/a-cleaner-yarra-river-and-port-phillip-bay/algal-blooms-in-port-phillip-bay> (last updated Sept. 4, 2014), archived at <http://perma.cc/8FE8-5287>.

²⁸⁶ See Ridley et al., *supra* note 285, at 1216.

tural industries contribute to the problem, fertilized and grazed pastures, annual crops, and gully and/or stream bank erosion from grazing livestock are the most common causes.²⁸⁷

Nevertheless, despite the emergence of water quality problems in Victoria, there have been insufficient political impetuses to act.²⁸⁸ Visual problems occur only periodically, the dominant sources of pollution are diffuse, and dramatic events such as rivers catching on fire have not occurred.²⁸⁹ Although the Gippsland Lakes and Melbourne's Bays have had periodic restrictions on swimming, the restrictions have not been dramatic enough to incite regulatory efforts.²⁹⁰

A number of entities have authority over water systems in Victoria.²⁹¹ The state government continues to maintain primary responsibility for its own water quality, and much of that responsibility rests in the Environmental Protection Authority Victoria ("EPAV").²⁹² The state, however, has delegated considerable power to local Catchment Management Authorities that manage floodplains, waterways, drainage, and environmental water reserves under the supervising authority of the Victoria Department of Environment and Primary Industries.²⁹³ Finally, various water authorities—such as Melbourne Water—exercise considerable authority over drinking water supplies and sewage treatment.²⁹⁴ Overall, the current regulatory system has been described as largely ineffective in advancing sustainable water management, with the notable partial exception of the Murray-Darling Basin, where water scarcity and

²⁸⁷ Graeme Doole et al., *Cost-Effective Strategies to Mitigate Multiple Pollutants in An Agricultural Catchment in North Central Victoria, Australia*, 57 AUSTL. J. AGRIC. & RES. ECON. 441, 444, 458 (2013); Roberts et al., *Agricultural Land Management Strategies*, *supra* note 285, at 15.

²⁸⁸ See, e.g., CRAIG, *supra* note 26, at 284–91.

²⁸⁹ See *id.*

²⁹⁰ *Algal Blooms in Port Phillip Bay*, *supra* note 285; *Beach Report—Water Quality Forecast*, CLEANER YARRA & BAY, <http://www.cleaneryarrabay.vic.gov.au/beach-report> (last updated Nov. 10, 2014), *archived at* <http://perma.cc/N5EM-U8DR>; *Gippsland Lakes Algae Weekly Update*, VICT. DEP'T OF ENV'T & PRIMARY INDUS., <http://www.depi.vic.gov.au/water/rivers-estuaries-and-wetlands/blue-green-algae/gippsland-lakes-algae-weekly-update> (last updated Apr. 23, 2014), *archived at* <http://perma.cc/3NE3-K9AJ>.

²⁹¹ See *Who We Are*, ENV'T PROT. AUTH. VICT., <http://www.epa.vic.gov.au/about-us/who-we-are> (last updated Oct. 1, 2014), *archived at* <http://perma.cc/9NYY-XSBG>.

²⁹² See *id.* (laying out the EPAV's authorities and programs).

²⁹³ Anna M. Roberts et al., *The Role of Regional Organisations in Managing Environmental Water in the Murray-Darling Basin, Australia*, 30 ECON. PAPERS 147, 150 tbl.1 (2011) [hereinafter Roberts et al., *Role of Regional Organisations*] (providing a brief description of the differences in the level of development from state to regional groups in Australian states); *Catchment Management Authorities*, VICT. WATER INDUS. ASS'N, <http://vicwater.org.au/victorian-water-industry/catchment-management-authorities> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/8B35-JHL4>.

²⁹⁴ *Legislation and Policies*, MELBOURNE WATER, <http://www.melbournewater.com.au/aboutus/whowere/Legislationandpolicies/Pages/Legislation-and-policies.aspx> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/PK4G-F7CG>.

salinity issues have been addressed²⁹⁵ and the national Commonwealth Government provided strong leadership and involvement.²⁹⁶

There is no single act or government agency with the authority or responsibility to address diffuse-source pollution in Victoria, or indeed in any state of Australia.²⁹⁷ Relevant Victorian Acts are the Environmental Protection Act 1970,²⁹⁸ the Water Act 1989,²⁹⁹ and the Catchment and Land Protection (“CALP”) Act 1994.³⁰⁰ In addition to the lack of sustained water quality problems and less litigious culture in Australia than in the United States, the lack of clarity in current regulations is a major barrier to addressing water quality in Victoria.³⁰¹

1. The Victoria Environment Protection Act 1970 and SEPPs

The Victoria’s Environment Protection Act 1970 created the EPAV, the Environment Protection Council, and the Environment Protection Appeals Board.³⁰² Under the Environment Protection Act 1970, the EPAV can identify environmental objectives, restrict or prohibit environmentally damaging activities, and devise programs to attain and maintain environmental objectives.³⁰³ The Act allows the EPAV—through orders of the Governor in Council—to establish state environmental policies, to classify or set aside areas in special

²⁹⁵ Nelson, *Legislation for ICM*, *supra* note 279, at 128; see *Basin Plan Implementation*, MURRAY-DARLING BASIN AUTH., <http://www.mdba.gov.au/what-we-do/basin-plan/basin-plan-implementation> (last visited Nov. 13, 2014), archived at <http://perma.cc/93E6-9K6D>.

²⁹⁶ Nelson, *Legislation for ICM*, *supra* note 279, at 128; *Basin Plan Implementation*, *supra* note 295.

²⁹⁷ See *supra* note 291 and accompanying text.

²⁹⁸ *Environment Protection Act 1970* (Vic) s 5 (Austl.), available at http://www.austlii.edu.au/cgi-bin/download.cgi/cgi-bin/download.cgi/download/au/legis/vic/consol_act/epa1970284.pdf, archived at <http://perma.cc/Y6VV-HAMH>. There is also subordinate legislation of two State Environmental Protection Policies in 1997 and 2003, which address groundwaters and surface waters respectively. *Environment Protection Act 1970, Variation to State Environment Protection Policy 2003 (Waters of Victoria)* (Vic) ss 4–6 (Austl.), available at <http://www.gazette.vic.gov.au/gazette/Gazettes2003/GG2003S107.pdf>, archived at <http://perma.cc/F8TX-GYKS>; *State Environment Protection Policy (Groundwaters of Victoria) 1997* (Vic) s 9 (Austl.), available at <http://www.epa.vic.gov.au/~media/Publications/S160.pdf>, archived at <http://perma.cc/MBB6-2D6K>.

²⁹⁹ *Water Act 1989* (Vic) (Austl.), available at http://www.austlii.edu.au/cgi-bin/download.cgi/cgi-bin/download.cgi/download/au/legis/vic/consol_act/wa198983.pdf, archived at <http://perma.cc/4P3P-UJRN>.

³⁰⁰ *Catchment and Land Protection Act 1994* (Vic) (Austl.), available at http://www.austlii.edu.au/cgi-bin/download.cgi/cgi-bin/download.cgi/download/au/legis/vic/consol_act/calpa1994267.pdf, archived at <http://perma.cc/7G5Y-7QNL>.

³⁰¹ See *infra* notes 302–382 and accompanying text.

³⁰² *Environment Protection Act 1970* (Vic) s 5 (Austl.), available at http://www.austlii.edu.au/cgi-bin/download.cgi/cgi-bin/download.cgi/download/au/legis/vic/consol_act/epa1970284.pdf, archived at <http://perma.cc/T6K2-BTLY>.

³⁰³ See *id.* s 18.

need of protection, and to promulgate rules to effectuate those protections.³⁰⁴ Thus, the EPAV has broad authority to identify environmental objectives, to forcibly restrict or prohibit environmentally damaging activities, and to construct programs to attain and maintain environmental objectives.³⁰⁵

In addition, the Environment Protection Act 1970 made it illegal to discharge, emit, or deposit wastes into the environment without a license or permit.³⁰⁶ The Act does not define “discharge,” “emit,” or “deposit,” but these terms are arguably broad enough to include at least some diffuse sources of pollution, especially if the pollution is connected to a point source.³⁰⁷

As the licensing authority, the EPAV can deny licenses for public health or other reasons, and it has broad authority to impose “conditions[,] limitations[,] and restrictions as it thinks fit.”³⁰⁸ Licenses must also be consistent with existing environmental policies.³⁰⁹ The license can require the licensee to monitor discharges, emissions, or deposits at the licensee’s expense and to provide monitoring reports to the EPAV.³¹⁰ Discharging, emitting, or depositing wastes into the environment without a license, or violating the terms of a license, are punishable offenses.³¹¹

With respect to waters, the Environment Protection Act 1970 declares that any discharge of waste must be in accordance with state environmental policies and must comply with any standards prescribed in the Act.³¹² Section 39

³⁰⁴ *Id.* ss 16–17.

Environmental policies issued under this authority shall establish the basis for maintaining environmental quality sufficient to protect existing and anticipated beneficial uses in the area affected by the Order and in particular shall include in terms sufficiently clear to give an adequate basis for planning and licensing functions—

- (a) the boundaries of any area affected;
- (b) identification of the beneficial uses to be protected;
- (c) selection of the environmental indicators to be employed to measure and define the environmental quality;
- (d) a statement of the environmental quality objectives (where practicable); and
- (e) the programme (if any) by which the stated environmental quality objectives are to be attained and maintained.

Id. s 18.

³⁰⁵ *See id.* ss 16–18.

³⁰⁶ *Id.* s 20. Wastes are defined as “any matter prescribed to be waste and any matter, whether liquid, solid, gaseous, or radioactive, which is discharged, emitted, or deposited in the environment in such volume, constituency or manner as to cause an alteration of the environment.” *Id.* s 4.

³⁰⁷ *See id.* ss 1–58 (showing that the Act does not define these terms).

³⁰⁸ *Environment Protection Act 1970* (Vic) s 20(5)(b), 20(6).

³⁰⁹ *Id.* s 20(9) (Austl.).

³¹⁰ *Id.* s 21.

³¹¹ *Id.* s 27.

³¹² *Id.* s 38.

of the Act also makes it illegal for any person to pollute or “cause or permit” any waters to become polluted.³¹³

Consistent with Victoria’s overall focus on ambient water quality, Section 39 requires an actual or reasonably expected effect on water quality before a person has “polluted” in violation of the law.³¹⁴ The Act’s definition of “pollution” underscores this “environmental effect” limitation.³¹⁵ Nevertheless, Section 39 does indicate that the Act should reach some forms of diffuse or runoff pollution.³¹⁶ The Environment Protection Act 1970 also provides the EPAV with extensive enforcement authority³¹⁷ and expressly preserves common-law rights to be free of pollution,³¹⁸ suggesting that citizens could seek to enjoin water pollution under common-law public nuisance claims.³¹⁹

The EPAV has created two State Environment Protection Policies (“SEPPs”) relevant to water quality in Victoria.³²⁰ The December 1997 Groundwaters of Victoria SEPP (“GV SEPP”) establishes beneficial uses and groundwater quality indicators and objectives for Victoria’s aquifers.³²¹ It indicates that “[a]ll practicable measures *must* be undertaken to prevent pollution of groundwater”³²² and thus appears to create an enforceable requirement for sources of groundwater contamination.³²³ In addition, the EPAV can direct the cleanup of contaminated groundwater, which is itself a form of an enforceable water quality requirement.³²⁴

The GV SEPP generally prohibits discharges of wastes into groundwater.³²⁵ The policy does, however, allow discharges of “irrigation drainage” if the relevant agency is satisfied that groundwater quality objectives will be met

³¹³ *Id.* s 39. “Pollute” is arguably even broader than “discharge,” “emit,” or “deposit”; the Act’s definition of “pollution,” however, ties pollution directly to discharging, emitting, and depositing, suggesting that Section 39 does not expand the scope of sources covered. *See id.*

³¹⁴ *See id.*

³¹⁵ *See Environment Protection Act 1970* (Vic) s 4 (Austl.).

³¹⁶ *Id.* s 39(2)(b). The Act specifies that a person violates the prohibition on polluting if that person “places any waste, whether solid, liquid, or gaseous, in a position where it falls, descends, drains, evaporates, is washed, is blown, or percolates, or is likely to fall, descend, drain, evaporate, be washed, be blown, or percolate into any waters.” *Id.*

³¹⁷ *See id.* ss 54–69.

³¹⁸ *Id.* s 65.

³¹⁹ *See id.* Certain land use-based challenges could also be relevant, though land use is beyond the scope of this Article. *See id.*

³²⁰ *See State Environment Protection Policy (Groundwaters of Victoria) 1997* (Vic) s 9 (Austl.).

³²¹ *See id.* ss 9, 10 tbl.3.

³²² *Id.* s 12 (emphasis added).

³²³ *See id.* In the United States, “practicable” is eminently definable in common law litigation contexts and has been the subject of considerable judicial and administrative interpretation in U.S. environmental law. *See, e.g.,* *City of Shoreacres v. Waterworth*, 332 F. Supp. 2d 992, 1019–23 (S.D. Tex. 2004) (evaluating whether sites were “practicable alternatives”).

³²⁴ *State Environment Protection Policy (Groundwaters of Victoria) 1997* (Vic) s 13 (Austl.).

³²⁵ *Id.* s 20.

and there is no detriment to beneficial uses of groundwater, surface water, or land.³²⁶ Moreover, diffuse sources that can pollute groundwater must operate consistently with established best practices,³²⁷ again apparently creating an enforceable water quality requirement for any diffuse source activity that puts groundwater at risk.³²⁸ In other words, the GV SEPP arguably imposes a legal duty on diffuse source polluters to identify and implement current best practices.³²⁹

The June 2003 Waters of Victoria SEPP (“WV SEPP”) identifies water quality goals for Victoria’s surface waters and the entities responsible for achieving those goals.³³⁰ Specifically, the WV SEPP establishes beneficial uses for the various types of water bodies in the state³³¹ and then designates water quality objectives and indicators—in Schedule A—using a risk management approach.³³² Nevertheless, despite its focus on ambient water quality goals and targets, the WV SEPP provides little in terms of enforceable mechanisms to achieve those targets.³³³

In contrast, the WV SEPP provides more specificity regarding licensing of waste discharges.³³⁴ Licenses for new wastewater discharges must include

³²⁶ *See id.*

³²⁷ *Id.* s 24.

³²⁸ *See id.*

³²⁹ *See id.*

³³⁰ *Environment Protection Act 1970, Variation to State Environment Protection Policy 2003 (Waters of Victoria)* (Vic) ss 4–6 (Austl.). The entities are the Environment Protection Authority, catchment authorities, regional coastal boards, the Department of Sustainability and Environment, the Department of Primary Industries, and local communities, among others. *Id.*

³³¹ *Id.* s 10, tbl.1.

³³² *Id.* Surface waters and their aquatic ecosystems need to be free of any substance at a level—or human impact—that would pose a risk to beneficial uses. *Id.* s 11. Risks would be manifested, for example, through human health impacts, the increased occurrence of fish kills and algal blooms, excessive growth of aquatic plants, sedimentation, loss of biodiversity and environmental flows, loss of cultural and spiritual values, objectionable odors, colors, taints, visible floating material, foam, oil or grease, or dirty water. *Id.* s 10, tbs.1, 11. The environmental quality objectives describe the level of environmental quality needed in most surface waters to avoid risks to beneficial uses and to protect them. *Id.* s 11. If an objective is not attained, the beneficial uses are likely to be at risk. *Id.* The non-attainment of an objective will trigger further investigation to assess risks to beneficial uses. *Id.* If a risk is posed to beneficial uses, mitigating actions (that are consistent with the attainment program) need to be implemented. *Id.*

³³³ *Id.* s 27.

³³⁴ *Id.* Section 27 states:

To protect beneficial uses, the discharge of wastes and wastewater from licensed and unlicensed premises and activities to surface waters must be managed in accordance with the waste hierarchy, with priority given to avoiding the generation of wastewater. In licensing a wastewater discharge, the Environment Protection Authority will:

requirements for minimizing the amount of wastewater created and a separate environment improvement plan to reduce the impacts on beneficial uses.³³⁵ Moreover, the EPAV will deny licenses for new discharges to protect specific kinds of resources, such as potable water supplies and threatened beneficial uses.³³⁶

Regarding existing discharges, the EPAV requires a monitoring program to assess actual impacts and requires that licensees reduce their environmental impacts.³³⁷ In addition, residences and businesses generally must connect to a sewer system if one is available.³³⁸

Other requirements within the WV SEPP are similar to required best management practices (“BMPs”).³³⁹ For example, chemicals “must not be stored in or adjacent to surface waters, drainage lines or floodplains, unless the storage facilities prevent them from coming into contact with surface waters,” and “[i]nstream and riparian chemical spraying practices need to be consistent with guidance approved by the Environment Protection Authority”³⁴⁰

With respect to animal wastes, however, the WV SEPP gives little guidance on best waste management practices.³⁴¹ This gap is consistent with the WV SEPP’s most pervasive approach to agricultural pollution in catchments, including agricultural runoff: placing primary authority for developing and

(1) consider the existing environmental quality of surface waters and protection of beneficial uses, and the potential impacts of future wastewater discharges on beneficial uses;

(2) require licence [sic] holders to implement effective wastewater management practices that minimise environmental risks to beneficial uses. The Environment Protection Authority will provide guidance on wastewater management practices;

(3) only approve wastewater management practices, including disinfection, that will not increase the toxicity of the wastewater discharge; and

(4) not approve a wastewater discharge that, according to toxicity tests approved by the Environment Protection Authority, displays acute lethality at the point of discharge or causes chronic impacts outside any declared mixing zone, except that a waste discharge containing a non-persistent substance that degrades within any declared mixing zone may be approved.

Id.

³³⁵ *Id.* s 28.

³³⁶ *Environment Protection Act 1970, Variation to State Environment Protection Policy 2003 (Waters of Victoria)* (Vic) s 28(3) (Austl.).

³³⁷ *Id.* s 29.

³³⁸ *Id.* s 34.

³³⁹ *See id.* s 37.

³⁴⁰ *Id.* In particular, in-stream and riparian spraying needs to be avoided in the Aquatic Reserves and Highlands segments. *Id.*

³⁴¹ *See id.* s 39.

implementing BMPs and water quality improvement measures in the hands of the landowner-farmer.³⁴²

2. The Victoria Water Act 1989

The Victoria Water Act 1989 (“Water Act”) seeks “to make sure that water resources are conserved and properly managed for sustainable use for the benefit of present and future Victorians.”³⁴³ The Water Act establishes an Environmental Water Reserve to preserve the environmental and ecological values of water basins, including water quality.³⁴⁴ The Water Act also establishes public-governmental and private rights to take and use water.³⁴⁵

Much of the Act focuses on water supply, water resource planning, and water use rights.³⁴⁶ These provisions do not directly address water quality or provide enforceable mechanisms for improving water quality at the source.³⁴⁷ Nevertheless, because the provision of more water *in situ* generally improves water quality, the Act does provide for an inherent mechanism for improving water quality.³⁴⁸ Under the Act, environmental entitlements can be authorized specifically to improve water quality.³⁴⁹ In addition, water licenses are subject to a number of conditions to protect environmental quality.³⁵⁰ For example, with respect to agricultural water use, the Act makes it an offense to “use water for irrigation on land, or knowingly cause or permit water to be used for irrigation on land, being water that is from a declared water system, unless the person does so under a water-use license that authorizes the use of water for that purpose on that land.”³⁵¹

One aspect where the Water Act does directly allow for water quality measures is in water supply protection. Designated authorities under the Act may enter land and remove “any substance or thing that is, in the Authority’s opinion,

³⁴² See *Environment Protection Act 1970, Variation to State Environment Protection Policy 2003 (Waters of Victoria)* (Vic) s 51 (Austl.). The exception is for intensive agriculture industries:

Wastes and wastewater from intensive agricultural industries must not be discharged to surface waters. To enable this, managers of intensive agricultural operations need to implement effective management practices that are consistent with guidance from protection agencies, including where relevant, that provided in approved protocols, guidelines and codes of practice.

Id. s 52.

³⁴³ *Water Act 1989* (Vic) s 1 (Austl.).

³⁴⁴ *Id.* s 4B.

³⁴⁵ *Id.* ss 7–9.

³⁴⁶ *Id.* s 189.

³⁴⁷ *Id.* s 1.

³⁴⁸ See *id.*; *infra* notes 389–391 (supporting the notion that adding water to a source generally improves water quality in that source).

³⁴⁹ *Water Act 1989* (Vic) s 48B (Austl.).

³⁵⁰ *Id.* s 56.

³⁵¹ *Id.* s 64J.

likely to affect the purity of the Authority's water supply system."³⁵² In addition, the Authority can order any person to cease any activity that threatens the water supply.³⁵³ Melbourne Water has the same water supply protection authority.³⁵⁴ Authorities can also designate waters and lands for special protection.³⁵⁵ For these designated waterways, the Authorities can development management plans, including plans to improve their environmental quality.³⁵⁶ These provisions could thus allow for more effective water quality regulation in designated waters.³⁵⁷ Moreover, it is an offense for any person to interfere with water quality in designated lands.³⁵⁸

The primary value of the Water Act for direct regulation of water quality is this connection to water supply protection and designated waters.³⁵⁹ These powers rest with the Authorities and Melbourne Water and would necessarily need to be tailored to the types of waters being protected and the land uses surrounding them.³⁶⁰ Nevertheless, in the proper areas, these provisions supply significant potential regulatory authority to address agricultural pollution.³⁶¹

3. Catchment and Land Protection Act 1994

The Catchment and Land Protection Act 1994 ("CALP") seeks "to establish a framework for the integrated and coordinated management of catchments."³⁶² The Department of Sustainability and Environment ("DSE") and the Catchment Management Authorities have the primary responsibilities for implementing CALP.³⁶³ Landowners are also required to take "all reasonable steps" to: (a) avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner; (b) conserve soil; (c) protect water resources; (d) eradicate regionally prohibited weeds; (e) prevent the growth and spread of regionally controlled weeds; and (f) prevent the spread of, and as far as possible eradicate, established pest animals.³⁶⁴

³⁵² *Id.* ss 167–168.

³⁵³ *Id.* s 169.

³⁵⁴ *Id.* ss 171E–171G. Melbourne Water, a government-owned corporation that controls the water supply system in Melbourne, has the same water supply protection authority. *See infra* notes 385–399.

³⁵⁵ *Water Act 1989* (Vic) s 188 (Austl.).

³⁵⁶ *Id.* s 189.

³⁵⁷ *See id.*

³⁵⁸ *Id.* s 1.

³⁵⁹ *See id.*

³⁶⁰ *Legislation and Policies, supra* note 294.

³⁶¹ *See Water Act 1989* (Vic) s 20 (Austl.).

³⁶² *Catchment and Land Protection Act 1994* (Vic) s 4 (Austl.).

³⁶³ *See id.* ss 4, 20.

³⁶⁴ *Id.* s 20.

As a legal matter, a requirement that landowners be “reasonable” has long been enforceable through the common law of nuisance, common-law riparian rights regimes, and tort law negligence claims.³⁶⁵ In the Australian common law tradition, therefore, the lack of specificity regarding the meaning of “all reasonable steps” should not render this provision toothless.³⁶⁶ Nevertheless, CALP appears to anticipate the enforcement of the landowners’ duties through its land management notice process,³⁶⁷ which allows the Secretary to the Department of Environment and Primary Industries (the “Secretary”) to specify particular binding actions a landowner must take upon receipt of notice.³⁶⁸ Moreover, because this provision reaches all landowners in Victoria, its potential usefulness for addressing diffuse agricultural water pollution is great.³⁶⁹

Catchment planning and regional catchment strategies could also provide an indirect mechanism for improving water quality regulation, although CALP is more obtuse in requiring implementation than it is in requiring planning.³⁷⁰ A regional catchment strategy must assess water resources, establish objectives for them, “set a program of measures to promote improved use” of the waters, identify necessary actions to reach the objectives, and specify procedures for monitoring the implementation of the strategy.³⁷¹ CALP, however, does not require the catchment authority to mandate that the strategy be implemented or that water quality improvement actions be taken.³⁷² Instead, public land managers have to take the strategy into account.³⁷³

In addition, CALP anticipates that water quality and water supply protection could be reasons for establishing “Special Water Supply Catchment Areas” (“SWSCAs”), several of which already exist.³⁷⁴ A plan for a SWSCA must: (1) identify the land management issues to be dealt with in the plan; (2) state the program of action to be taken to deal with those issues, and the costs and benefits of that action; (3) state the targets to be achieved by that action; (4)

³⁶⁵ *Id.* Indeed, a court might decide, in the absence of more specific guidance from the implementing agency, that this provision merely specifies particular components of the underlying common-law requirement not to cause a nuisance. *See, e.g.,* *Bjorndal v. Weitman*, 184 P.3d 1115, 1120 (Or. 2008) (en banc) (explaining the “reasonable person” standard in tort law); *Bay Point High & Dry, L.L.C. v. New Palace Casino, L.L.C.*, 46 So.3d 821, 824 (Miss. Ct. App. 2010) (evaluating whether a landowner had taken “reasonable measures” to prevent harm to another property).

³⁶⁶ *See supra* note 365 and accompanying text.

³⁶⁷ *See Catchment and Land Protection Act 1994* (Vic) ss 37–44 (Austl.).

³⁶⁸ *Id.* ss 38, 40.

³⁶⁹ *See id.*

³⁷⁰ *See id.* s 24.

³⁷¹ *Id.*

³⁷² *Id.*

³⁷³ *See Catchment and Land Protection Act 1994* (Vic) s 26 (Austl.).

³⁷⁴ *See id.* s 27(2), sch 5.

allocate responsibility for taking that action and for bearing the costs of taking that action; and (5) provide for the review of the plan.³⁷⁵

In addition, SWSCA plans can impose land use conditions on properties within the plan area.³⁷⁶ These land use conditions can then become enforceable requirements for landowners, after the Secretary serves them.³⁷⁷ Once served, the land use conditions are binding on the landowner, and failure to comply with the land use conditions is an offense.³⁷⁸ CALP provides the Secretary with considerable authority to enforce land management notices and land use conditions, including authority to enter lands and to seize samples.³⁷⁹ Moreover, the Governor in Council can promulgate regulations for land use conditions and land management notices.³⁸⁰ SWSCA area designations could thus become an effective means of addressing particular water quality problems from agriculture in specific watersheds.³⁸¹ Further, the SWSCAs may provide reasonable places to begin pilot projects.³⁸²

B. Actual Protection of Water Quality from Diffuse Source Pollution in Victoria: An Assessment

Despite the plethora of laws that Victoria has enacted that could protect waters from diffuse source pollution, the state's actual efforts to improve water quality and to address nonpoint sources have been rather toothless.³⁸³ The greatest impetus to act in Victoria appears to come from maintaining water supply catchments, fishing, recreation, and tourism close to Melbourne and in coastal areas.³⁸⁴ The four following case study analyses demonstrate the operation—or lack thereof—of Victoria's laws. The first two studies address water supply issues, whereas the last two more specifically involve water quality concerns.

1. Melbourne Water—Water Supply and Other Drivers

Melbourne Water is a government-owned corporation with the powers of a statutory authority.³⁸⁵ It controls the water supply system in Melbourne,

³⁷⁵ *Id.* s 30.

³⁷⁶ *Id.*

³⁷⁷ *Id.* s 33.

³⁷⁸ *Id.* ss 34–35.

³⁷⁹ *See Catchment and Land Protection Act 1994* (Vic) ss 79–90 (Austl.).

³⁸⁰ *Id.* s 95.

³⁸¹ *Id.*

³⁸² *Id.* s 35.

³⁸³ *See supra* notes 302–382 and accompanying text.

³⁸⁴ *See infra* notes 385–467 and accompanying text.

³⁸⁵ *Legislation and Policies, supra* note 294.

which currently has a population of 4.25 million people but is expected to almost double by 2051.³⁸⁶ The water supply system includes the reservoirs and the sewage and drainage system that services the city. Melbourne Water also has the responsibility for maintaining the health of rivers, acting in the role of a Catchment Management Authority for the Melbourne region.³⁸⁷

The majority of Melbourne Water's water supply watersheds are protected—forested and publically owned.³⁸⁸ Although there are water quality problems from agricultural land, the fact that water supply downstream comes mostly from reservoirs filled from the protected, relatively closed catchments limits water quality problems.³⁸⁹ In addition, the ten storage reservoirs in the system are interconnected, allowing managers to move high quality water around to dilute water quality problems.³⁹⁰ As a result, the water supply system is flexible enough that managers can identify potential algal blooms in advance and mitigate them by avoiding taking water from affected reservoirs and transferring water from others.³⁹¹

Given that the water supply catchments are largely protected, the major driver for Melbourne Water to act on water quality arises from the value the population of Melbourne places on rivers—particularly the Yarra—and Port Phillip and Western Port Bays. Highly desirable residential areas have sprung up next to Melbourne's bays and rivers, and these water bodies underpin much of the region's recreation and tourism activity, as well as commercial activities such as port operation and commercial fishing.³⁹² All of these waterways have water quality issues, but none have been sufficiently severe or consistent to prompt citizen demands for action.³⁹³ Urban land uses make up a small proportion of the total catchment area, but they contribute a disproportionately large

³⁸⁶ Alison Savage, *Melbourne's Population Set to Almost Double to 7.7 Million by 2051*, AUSTL. BROAD. CORP. NEWS, (May 19, 2014, 7:33 AM), <http://www.abc.net.au/news/2014-05-19/melbourne-population-to-almost-8-million/5462558>, archived at <http://perma.cc/ZC5P-EM5A>.

³⁸⁷ *What We Do*, MELBOURNE WATER, <http://www.melbournewater.com.au/whatwedo/Pages/whatwedo.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/8ZQX-VPPE>.

³⁸⁸ *Water Catchments*, MELBOURNE WATER, <http://www.melbournewater.com.au/whatwedo/supply-water/Water-catchments/Pages/water-catchments.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/ZW37-5Q87>.

³⁸⁹ *See id.*

³⁹⁰ *Water Supply System*, MELBOURNE WATER, www.melbournewater.com.au/whatwedo/supply-water/Pages/Water-supply-system.aspx (last visited Nov. 13, 2014), archived at <http://perma.cc/PV35-88GH>.

³⁹¹ *Id.*

³⁹² *See Our Region: Bays & Coasts*, PORT PHILLIP & WESTERNPORT CATCHMENT MGMT. AUTH., <http://www.ppwma.vic.gov.au/our-region/bays-coasts.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/3SXU-PZX9>.

³⁹³ *Yarra Watch—Water Quality Forecast*, CLEANER YARRA & BAY, <http://www.cleaner.yarrabay.vic.gov.au/yarra-watch> (last updated Nov. 10, 2014), archived at <http://perma.cc/3DWJ-EVXU>.

amount of the total contaminant load.³⁹⁴ This is most pronounced in Port Phillip Bay, where stormwater runoff from urban land uses was the greatest source of contaminant load.³⁹⁵

Nonpoint source pollution from rural land is also important. Rural land accounts for approximately 55% of land use in the Port Phillip catchment and 77% in Western Port, and includes rural roads, towns and agricultural land.³⁹⁶ Sediment, nitrogen, and phosphorus runoff from rural land contributes an estimated 30–40% of the contaminant loads in Port Phillip Bay and 75–85% in Western Port.³⁹⁷

Nevertheless, the only actions taken to address diffuse source agricultural pollution have been to allow landholders living in high nutrient load target watersheds to receive financial assistance and technical advice through Melbourne Water and other government agencies, to improve on-farm management practices.³⁹⁸ A study was recently done to provide advice on what would have to occur if Melbourne Water decided it needed to do more about diffuse source pollution than it currently does, but there are, as of yet, no signs that the issue is sufficiently urgent for such action.³⁹⁹

Overall, Melbourne Water has greater authority to address diffuse source pollution problems than Catchment Management Authorities,⁴⁰⁰ but so far it has provided only limited assistance to undertake voluntary on-farm management practices. This limited action may, in large part, result from the fact that the water supply system is sufficiently flexible to deal with periodic water quality issues that arise, reducing the need to act.⁴⁰¹

³⁹⁴ ENVTL. PROT. AUTH. VICT. & MELBOURNE WATER, BETTER BAYS AND WATERWAYS: A WATER QUALITY IMPROVEMENT PLAN FOR PORT PHILLIP AND WESTERN PORT 53, 56 (2009), available at http://www.melbournewater.com.au/aboutus/reportsandpublications/key-strategies/Documents/Better_Bays_and_Waterways_Plan%20-%202009.pdf, archived at <http://perma.cc/E8GS-5BVQ> (19% of the Port Phillip region and 2% of the Western Port region).

³⁹⁵ *Id.* (49% to 60% of the modelled sediment and nutrient loads).

³⁹⁶ *Id.* Rural land sources include dryland grazing (beef, sheep, dairy), cropping, and lifestyle properties.

³⁹⁷ *See id.*

³⁹⁸ *Rural Land Program*, MELBOURNE WATER, <http://www.melbournewater.com.au/getinvolved/applyforfunding/pages/rural-land-program.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/AU4B-FBUN>.

³⁹⁹ MELBOURNE WATER ET AL., IMPROVING OUR UNDERSTANDING OF WATER SENSITIVE FARM DESIGN POLLUTION TREATMENT SYSTEMS, at i–iv (2013), available at http://www.urbanstreams.unimelb.edu.au/Docs/WSFD_posfrmwk.pdf, archived at <http://perma.cc/X9PA-43WR>.

⁴⁰⁰ *See supra* note 293 and accompanying text.

⁴⁰¹ *See supra* notes 390–391.

2. Open Water Supply Catchments—The Case of Tullaroop

A landmark legal decision concerning the Tullaroop open water supply catchment in 2012 has been the most unexpected recent driver of water quality reform in Victoria.⁴⁰² At issue was whether Tullaroop should be considered a potable water supply catchment within the meaning of Section 149B of the Planning and Environment Act 1987 Guidelines (the “Guidelines”).⁴⁰³ The Guidelines explicitly apply to all open, potable water supply catchments declared to be special water supply catchment areas under Division 2 of Part 4 of the CALP.⁴⁰⁴ The Victorian Civil and Administrative Tribunal held that the definition in the Guidelines of a potable water supply is not limited to a situation where the water resources from the catchment as a whole are used primarily for domestic supply purposes, and therefore the Tullaroop catchment is considered to be an open, potable water supply catchment within the meaning of the Guidelines.⁴⁰⁵ The decision comes at a time when the Tullaroop catchment, like a number of others in Victoria, is under pressure from increased rural residential development beyond the current limit of one residence per forty hectares.⁴⁰⁶

The decision has implications for all open, potable water supply catchments in Victoria and paves the way for increased regulation through planning permits for urban, industrial, and agricultural land uses.⁴⁰⁷ In response to the decision, Coliban Water—one of the larger Victorian Regional Urban Water authorities—developed a Catchment Water Quality Protection and Guidelines document to help ensure that the Declared Special Areas⁴⁰⁸ under the CALP are given necessary protection to ensure adequate water quality.⁴⁰⁹ In addition

⁴⁰² *Simpson v Ballarat CC*, [2012] VCAT 133 (Austl.), available at <http://www.austlii.edu.au/au/cases/vic/VCAT/2012/133.html>, archived at <http://perma.cc/LRL9-X9UT> (deciding whether the Tullaroop catchment was a potable water supply catchment within the meaning of the relevant laws). An open catchment is where part or all of the catchment area is under private ownership and yet access to the catchment is unrestricted. *Id.*

⁴⁰³ *Id.* ¶ 1(2); see *Planning and Environment Act 1987* (Vic) s 60(1A)(g) (Austl.), available at http://www.austlii.edu.au/au/legis/vic/consol_act/paea1987254/s60.html, archived at <http://perma.cc/CD5H-JRMH>; VICT. DEP’T OF SUSTAINABILITY & ENV’T, PLANNING PERMIT APPLICATIONS IN OPEN, POTABLE WATER SUPPLY CATCHMENT AREAS (2012), available at <http://www.sgwater.com.au/wp-content/uploads/2014/03/Guidelines-for-Planning-permit-Applications-in-Open-Potable-Water-Supply-Catchment-Areas-Nov-2012.pdf>, archived at <http://perma.cc/7HE3-JN34>.

⁴⁰⁴ *Simpson*, [2012] VCAT 133 ¶¶ 21–22.

⁴⁰⁵ *Id.* ¶ 77.

⁴⁰⁶ *Id.* ¶ 37.

⁴⁰⁷ COLIBAN WATER, CATCHMENT WATER QUALITY PROTECTION: POLICY AND GUIDELINES FOR PLANNING PERMIT APPLICATIONS & GOVERNMENT PLANNING INITIATIVES 3 (2013), available at <http://www.coliban.com.au/site/root/sustainability/documents/CatchmentPolicyandGuidelines.pdf>, archived at <http://perma.cc/WFJ3-3DNF>.

⁴⁰⁸ *Id.*

⁴⁰⁹ *Id.*

to the residential limitations, the Coliban Water Guidelines state that industrial and intensive land use activities must adopt best practice environmental management systems to protect water quality,⁴¹⁰ that it will not support applications for piggeries, cattle feedlots and other intensive animal industries where risks cannot be satisfactorily mitigated,⁴¹¹ that agricultural activities must meet industry standards as outlined in a Department of Health publication,⁴¹² and, where available, best practice environmental management systems to protect water quality must be adopted.⁴¹³

Additionally, the Victoria Government has developed guidelines that apply to all such water supply catchments declared to be special water supply catchment areas under Division 2 of Part 4 of the CALP.⁴¹⁴ The guidelines have the potential to affect residential development through development density,⁴¹⁵ effluent and management disposal,⁴¹⁶ vegetated corridors and buffer zones along waterways,⁴¹⁷ buildings and works,⁴¹⁸ and agricultural activities.⁴¹⁹ Although the language in the guidelines is not particularly strong, the legal case signals that the water authorities might seek to use their powers more often in the future to protect drinking water supplies.⁴²⁰

3. Gippsland Lakes

Probably the most politically-pressing and persistent water quality problem in Victoria occurs in the Gippsland Lakes. The Gippsland Lakes are a set of waterways that constitute one of the sixty-four wetlands complexes in Australia with international significance under the Ramsar Convention—an international agreement dedicated to the conservation and wise use of wetlands—which gives the Commonwealth Government some authority to act to protect them, if it so chooses.⁴²¹ Victoria also has a significant interest in these ecosys-

⁴¹⁰ *Id.* at 6.

⁴¹¹ *Id.*

⁴¹² VICT. DEP'T OF HEALTH, PROTECT OUR WATERS, PROTECT OUR HEALTH (2010), available at [http://docs.health.vic.gov.au/docs/doc/DE201D37A5BA4EA9CA257AA90011F156/\\$FILE/protect_our_water.pdf](http://docs.health.vic.gov.au/docs/doc/DE201D37A5BA4EA9CA257AA90011F156/$FILE/protect_our_water.pdf), archived at <http://perma.cc/VVQ9-YGEK>.

⁴¹³ COLIBAN WATER, *supra* note 407, at 7.

⁴¹⁴ VICT. DEP'T OF SUSTAINABILITY & ENV'T, *supra* note 403, at 1.

⁴¹⁵ *Id.* at 3.

⁴¹⁶ *Id.* at 4.

⁴¹⁷ *Id.*

⁴¹⁸ *Id.*

⁴¹⁹ *Id.* (including minimising stock access to waterways, not over-stocking, reducing agricultural and veterinary chemical runoff, and inappropriate disposal of fuel and dead animals).

⁴²⁰ *See id.*

⁴²¹ Convention on Wetlands of International Importance Especially as Waterfowl Habitat, Feb. 2, 1971, T.I.A.S. No. 11,084, 996 U.N.T.S. 245, available at <https://treaties.un.org/doc/Publication/UNTS/Volume%20996/volume-996-I-14583-English.pdf>, archived at <http://perma.cc/TRN4-PERW>.

tems, because the Gippsland Lakes are home to Victoria's largest fishing fleet and support a range of tourism businesses.⁴²²

The primary land uses and water quality impacts to the Gippsland Lakes come from diffuse source pollution from agricultural industries—especially the dairy and beef industries.⁴²³ An environmental audit in 1998 concluded that the system was poised on the edge of a possibly irreversible degradation because of eutrophication.⁴²⁴ Control of the phosphorus problem is likely to be both prohibitively expensive—costs are estimated to be around AU\$1 billion over twenty years⁴²⁵—and politically difficult, including land retirement from agriculture.⁴²⁶ Funding levels between 2002 and 2009 were less than AU\$20 million.⁴²⁷

Although diffuse source pollution from both the dairy and beef industries is a major problem, the only regulatory authority the EPAV over those industries has is to manage dairy effluent.⁴²⁸ Dairy is Victoria's largest rural industry,⁴²⁹ and Gippsland is one of three major dairy regions.⁴³⁰ Deregulation of the dairy industry has led to major industry restructuring, including expansion of remaining dairy farms and challenging effluent storage capacity issues.⁴³¹ Ongoing non-compliance remains a problem, in part because the EPAV has not been given the resources to effectively manage dairy effluent.⁴³²

The Victoria Government's approach in the Gippsland Lakes has been to replace the previous governance arrangements from the Gippsland Lakes Task-

See *Country Profiles*, RAMSAR.ORG, <http://www.ramsar.org/country-profiles> (last visited Nov. 13, 2014), archived at <http://perma.cc/8F6U-J4BK> (listing the Ramsar Convention Member States).

⁴²² See *General Information*, GIPPSLAND LAKES MINISTERIAL ADVISORY COMM., <http://www.gippslandlakes.net.au/about-the-lakes-2/general-information/> (last visited Nov. 13, 2014), archived at <http://perma.cc/XWZ4-8L5C>.

⁴²³ See Roberts et al., *Agricultural Land Management Strategies*, *supra* note 285, at 12.

⁴²⁴ *Id.* A target of a forty percent reduction in the average annual nutrient (phosphorus and nitrogen) load entering the Lakes over twenty years, was agreed in 2002 by stakeholders comprising the then-governing body: The Gippsland Lakes Taskforce. *Id.* at 13.

⁴²⁵ *Id.* at 17.

⁴²⁶ *Id.* (nitrogen is likely to be even more difficult).

⁴²⁷ *Id.* at 18.

⁴²⁸ VICT. DEP'T OF PRIMARY INDUS., DAIRYGAINS, MANAGEMENT OF DAIRY EFFLUENT: 2008 DAIRYGAINS VICTORIAN GUIDELINES 4 (2008), available at <http://www.dairyingfortomorrow.com/uploads/documents/2008%20DairyGains%20Victorian%20Effluent%20Guidelines.pdf>, archived at <http://perma.cc/6NFJ-NFP2>.

⁴²⁹ *Dairy Industry Profile*, VICT. DEP'T OF ENV'T & PRIMARY INDUS., <http://www.depi.vic.gov.au/agriculture-and-food/dairy/dairy-industry-profile> (last updated Jan. 30, 2014), archived at <http://perma.cc/NF2E-97W2>.

⁴³⁰ *Id.*

⁴³¹ *Deregulation*, DAIRY AUSTR., <http://www.dairyaustralia.com.au/Industry-information/About-the-industry/Deregulation.aspx> (last visited Nov. 13, 2014), archived at <http://perma.cc/V3ZX-VYDN>.

⁴³² See *id.*

force with a ministerially appointed advisory committee.⁴³³ The Committee focuses on community education, incentives for landholders, shoreline protection, habitat protection and ecological studies.⁴³⁴ There is no mention of the need to consider regulation, nor whether the Committee is even likely to be able to significantly improve the condition of the Lakes with the current limited level of funding.⁴³⁵ Monitoring algal blooms is the main strategy to advise the public when recreational activities are impacted.⁴³⁶

Despite the national and the international significance of the Gippsland Lakes and the knowledge about the magnitude of the problem, there continues to be a lack of political will to address water quality problems. At the state level, there is very limited discussion about the need for improved regulation and enforcement of existing dairy effluent regulations or whether the Lakes can be adequately protected.⁴³⁷

4. Corner Inlet

Corner Inlet, which lies between Melbourne and the Gippsland Lakes, is another recognized Australian national water quality hotspot.⁴³⁸ Like the Gippsland Lakes, Corner Inlet is internationally recognized through the Ramsar Convention, and it too is threatened by water quality problems, mostly from agricultural sources.⁴³⁹ Corner Inlet is, however, in better ecological condition than the Gippsland Lakes, in part because it has greater tidal exchange and also because it is fed by a smaller watershed area.⁴⁴⁰ Significantly, as is

⁴³³ *The Committee*, GIPPSLAND LAKES MINISTERIAL ADVISORY COMM., <http://www.gippslandlakes.net.au/about-us/the-committee/> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/W9HF-3DUC>.

⁴³⁴ *Projects*, GIPPSLAND LAKES MINISTERIAL ADVISORY COMM., <http://www.gippslandlakes.net.au/our-projects/> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/NC25-3L4J>.

⁴³⁵ *See id.*

⁴³⁶ GIPPSLAND LAKES MINISTERIAL ADVISORY COMM., *ALGAE INFORMATION* (2012), *available at* <http://www.gippslandlakes.net.au/wp-content/uploads/2012/12/Algae-information2.pdf>, *archived at* <http://perma.cc/ARL3-DTSX>.

⁴³⁷ *See Standards and Compliance Guidelines*, ENVTL. PROT. AUTH. VICT., <http://www.epa.vic.gov.au/business-and-industry/guidelines/water-guidance/dairy-farms-and-water> (last updated July 26, 2012), *archived at* <http://perma.cc/2NHJ-SV5E>.

⁴³⁸ *Water Quality Hotspots*, AUSTL. GOV'T DEP'T OF ENV'T, <http://www.environment.gov.au/topics/water/water-quality/water-quality-improvement-plans/water-quality-hotspots/> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/9STJ-HRXQ>.

⁴³⁹ DICKSON ET AL., *supra* note 285, at 33; *Corner Inlet (Including Corner Inlet Ramsar Site)*, AUSTL. GOV'T DEP'T OF ENV'T, <http://www.environment.gov.au/topics/water/water-quality/water-quality-improvement-plans/water-quality-hotspots/victoria/corner> (last visited Nov. 13, 2014), *archived at* <http://perma.cc/EPG5-M8J5>.

⁴⁴⁰ DICKSON ET AL., *supra* note 285, at 29. It is therefore easier to protect than the Gippsland Lakes.

true in the Gippsland Lakes region, beef and dairy are important agricultural industries in Corner Inlet.⁴⁴¹

The Corner Inlet Water Quality Improvement Plan (the “Plan”), which is funded by the Australian Government and is to be implemented by the West Gippsland Catchment Management Authority—subject to funding—has recently been completed.⁴⁴² The Plan set targets for nitrogen, phosphorus, and sediment load reductions that are ambitious, although likely to be insufficient to achieve desired ecological outcomes, such as restoration of seagrass beds.⁴⁴³ Nevertheless, the water quality targets are within the realms of what industry could achieve if the funding were sufficient (implementation is estimated to require AU\$8.95 million per year).⁴⁴⁴

The target-setting process was informed by bio-economic modeling and the recognition that alienating agriculture would be politically difficult and counter-productive.⁴⁴⁵ Significantly, the Plan recognizes the need for a mix of incentives, extensions, and regulatory mechanisms at a much-increased scale, along with modelling, monitoring, and metrics tied to water quality objectives.⁴⁴⁶ The Plan recommends long-term land stewardship payments at a level sufficient to offset losses of agricultural production, in order to ensure that the benefits of BMPs are achieved and maintained, and to ensure greater accountability of public spending than is required of farmers under current programs.⁴⁴⁷ The Plan also specifically acknowledges the need for increased emphasis on assessing regulated activities’ compliance, including dairy effluent collection and management, both for initial implementation and for ongoing management, with compliance auditing and enforcement from the EPAV.⁴⁴⁸

The Plan is significant for a number of reasons. It has realistic targets established with the consideration of bio-economic modelling and detail-management actions.⁴⁴⁹ Costs are to be considered early on in the process, be-

⁴⁴¹ *Id.* at 50.

⁴⁴² See W. GIPPSLAND CATCHMENT MGMT. AUTH., CORNER INLET WATER QUALITY IMPROVEMENT PLAN 2013, at 2 (2013), available at http://www.wgma.vic.gov.au/images/stories/PDF/Programs/CORNER_INLET/corner-inlet-wqipweb.pdf, archived at <http://perma.cc/76A9-XN9M>; *Corner Inlet Water Quality Improvement Plan*, W. GIPPSLAND CATCHMENT MGMT. AUTH., <http://www.wgma.vic.gov.au/index.php/component/content/article/55/365-corner-inlet-water-quality-improvement-plan.html> (last updated Dec. 19, 2013), archived at <http://perma.cc/ERY7-YGY7>.

⁴⁴³ W. GIPPSLAND CATCHMENT MGMT. AUTH., *supra* note 442, at 47.

⁴⁴⁴ *Id.* at 55.

⁴⁴⁵ *Id.* at 3, 55, 63–64, 84.

⁴⁴⁶ *Id.* at 3, 7, 69–70.

⁴⁴⁷ *Id.* at 69.

⁴⁴⁸ *Id.* at 70.

⁴⁴⁹ *Id.* at 3, 7, 69–70.

fore ecological damage is so great that it becomes prohibitive.⁴⁵⁰ Costs were as realistically assigned as was possible and cover what it would take to achieve the changes required.⁴⁵¹ The Plan further acknowledges the need for a mix of policy approaches, including the need for increased regulation.⁴⁵² Additionally, assumptions about the risks, particularly those associated with the need for political will and long term funding, are highlighted, rather than obscured.⁴⁵³ Finally, the Plan recognizes that further discussion is required and that there are trade-offs between agriculture and achieving desired ecological outcomes.⁴⁵⁴

The Plan generally notes that funding, political will, and increased regulation are required to achieve water quality outcomes.⁴⁵⁵ It thus has the potential to put greater pressure on, and require greater accountability from, both the Commonwealth Government and the Victoria Government, or, at the very least, to make it slightly more difficult for the governments to continue on the “business as usual” path.⁴⁵⁶

5. Overall Effectiveness of Protecting Water Quality from Diffuse Source Pollution in Victoria

Institutional arrangements and the lack of political will are the largest barriers to addressing water quality reform in Victoria.⁴⁵⁷ The water quality problem is not yet so urgent that it is sufficiently politically sensitive for a large enough number of people; by the time water quality issues become politically salient enough for legal action, however, ecosystems could be close to, or beyond, repair at a cost that can be realistically contemplated.⁴⁵⁸ With the exception of drinking water standards, the failure to set water quality targets that hold governments accountable is particularly problematic, regardless of whether the targets are sufficiently stringent to return water quality to desired levels.⁴⁵⁹

⁴⁵⁰ *Id.* at 55.

⁴⁵¹ *Id.*

⁴⁵² *Id.* at 3, 7, 69–70.

⁴⁵³ *Id.* at 3, 55, 63–64, 84.

⁴⁵⁴ *Id.*

⁴⁵⁵ *See id.*

⁴⁵⁶ *See id.*

⁴⁵⁷ *See id.*; *cf. supra* notes 25–281 and accompanying text.

⁴⁵⁸ *See supra* notes 282–456 and accompanying text.

⁴⁵⁹ *See* Geoff Park et al., *The Quality of Resource Condition Targets in Regional Natural Resource Management in Australia* 10, 13 (Univ. of W. Austl., Sch. of Agric. & Res. Econ., Working Paper No. 1209, 2012), available at <http://ageconsearch.umn.edu/bitstream/126036/2/WP120009%20.pdf>, archived at <http://perma.cc/ZR97-EPND>.

As in the United States, agricultural industries in Victoria are understandably resistant to new regulation, and the fact that the EPAV lacks sufficient resources to be able to enforce existing regulations only exacerbates the government's reluctance to act.⁴⁶⁰ The Australian Commonwealth Government plans for water quality improvement, but it often does not fund implementation and monitoring.⁴⁶¹ Further, the national government is overly passive in its prioritization of water quality improvement.⁴⁶²

The Victoria Government has a weak regulatory culture and lacks the commitment to fund plans at the scale required, as evidenced by the woefully insufficient funding to protect the Gippsland Lakes by working to return them to the water quality target set.⁴⁶³ At present, there is little interest in water quality reform and limited policy leadership.⁴⁶⁴ Despite the good intentions of Catchment Management Authorities, these authorities lack institutional regulatory power and rely on partnerships to implement water quality improvement plans.⁴⁶⁵ Water authorities have a much stronger institutional basis on which to act, but are likely to do so only in open water supply catchments where there are human health concerns.⁴⁶⁶ When human health concerns do exist, however, water authorities have demonstrated that they will proactively work to solve the problem.⁴⁶⁷

IV. REGULATING NONPOINT SOURCE POLLUTION IN QUEENSLAND

A. Overview of Queensland's Water Quality Issues and Regulatory Structure

Although Australia has eutrophication problems in all states, what happens on the Great Barrier Reef in the State of Queensland—occupying most of the northeastern coast of Australia—is most likely to influence the national policy agenda on water quality.⁴⁶⁸ The world famous Great Barrier Reef is Australia's greatest natural asset: it has World Heritage Status⁴⁶⁹ and is consid-

⁴⁶⁰ See DICKSON ET AL., *supra* note 285, at 60; *supra* notes 251–268 and accompanying text.

⁴⁶¹ See DICKSON ET AL., *supra* note 285, at 60.

⁴⁶² See *id.*

⁴⁶³ Roberts et al., *Agricultural Land Management Strategies*, *supra* note 285, at 18.

⁴⁶⁴ Anna M. Roberts & Robin K. Craig, *Regulatory Reform Requirements to Address Diffuse Source Water Quality Problems in Australia: Learning from US Experiences*, 21 AUSTRALASIAN J. ENVTL. MGMT. 102, 102 (2014).

⁴⁶⁵ DICKSON ET AL., *supra* note 285, at 3, 64–65, 67.

⁴⁶⁶ *Simpson v Ballarat CC*, [2012] VCAT 133 (Austl.) (deciding whether the Tullaroop catchment was a potable water supply catchment within the meaning of the relevant laws).

⁴⁶⁷ See *id.*

⁴⁶⁸ See *infra* notes 469–481 and accompanying text.

⁴⁶⁹ *Great Barrier Reef*, UNITED NATIONS EDUC., SCIENTIFIC & CULTURAL ORG., <http://whc.unesco.org/en/list/154> (last visited Nov. 13, 2014), archived at <http://perma.cc/RQW5-BC9V>.

ered one of the Seven Wonders of the Natural World.⁴⁷⁰ The Great Barrier Reef contributes AU\$6 billion to Queensland's economy per year and supports over 60,000 jobs.⁴⁷¹ It faces multiple contamination and pollution threats, including substantial diffuse source agriculture pollution from excess nutrients (nitrogen and phosphorus), fine sediments, and pesticides (photosystem II inhibiting herbicides).⁴⁷² The dissolved nutrient and pesticide issues are largely attributed to sugar cane, and the particulate nutrient and sediment pollution primarily come from grazing and gully and stream bank erosion.⁴⁷³

The sheer size of the Great Barrier Reef Marine Park, which extends over 2300 kilometers along the Queensland coastline and covers approximately 344,400 square kilometers, and its terrestrial watershed, which covers 423,000 square kilometers—together, nearly six percent of the total landmass of the Australian continent—makes the Great Barrier Reef and its terrestrial watershed very difficult to protect.⁴⁷⁴ Nevertheless, given the Great Barrier Reef's international significance, both the Australian and Queensland Governments are taking active responsibility for protecting it.⁴⁷⁵ The Commonwealth is responsible for managing the Great Barrier Reef Marine Park, established by the Great Barrier Reef Marine Park Act 1975,⁴⁷⁶ and the Queensland Government is responsible for managing the Great Barrier Reef Coast Marine Park, established by Queensland's Marine Parks Act 2004.⁴⁷⁷

⁴⁷⁰ Rosenberg, *supra* note 24.

⁴⁷¹ *Join the Fight for the Reef*, AUSTL. MARINE CONSERVATION SOC'Y, <http://www.marineconservation.org.au/pages/fight-for-the-reef.html> (last visited Nov. 13, 2014), archived at <http://perma.cc/8EMH-L7BD>.

⁴⁷² JON BRODIE ET AL., STATE OF QUEENSL., 2013 SCIENTIFIC CONSENSUS STATEMENT: LAND USE IMPACTS ON THE GREAT BARRIER REEF WATER QUALITY AND ECOSYSTEM CONDITION 1 (2013), available at <http://www.reefplan.qld.gov.au/about/assets/scientific-consensus-statement-2013.pdf>, archived at <http://perma.cc/U5FU-RDJ5>.

⁴⁷³ *Id.* at 7–8.

⁴⁷⁴ Peter J. Thorburn & Scott N. Wilkinson, *Conceptual Frameworks for Estimating the Water Quality Benefits of Improved Agricultural Management Practices in Large Catchments*, 180 AGRIC., ECOSYSTEMS & ENV'T 192, 194 (2013), available at <http://www.sciencedirect.com/science/article/pii/S0167880912000059>.

⁴⁷⁵ See *infra* notes 476–481 and accompanying text.

⁴⁷⁶ *Great Barrier Reef Marine Park Act 1975* (Cth) (Austl.), available at <http://www.comlaw.gov.au/Details/C2014C00236>, archived at <http://perma.cc/K952-RCDW>.

⁴⁷⁷ *Marine Parks Act 2004* (Qld) s 8 (Austl.), available at <https://www.legislation.qld.gov.au/LEGISLTN/ACTS/2004/04AC031.pdf>, archived at <http://perma.cc/8CDD-YJCW>. The Great Barrier Reef Coast Marine Park is contiguous with the Great Barrier Reef Marine Park and covers the area between low and high water marks and many waters within the limits of the State of Queensland. *Great Barrier Reef Coast Marine Park*, QUEENSL. GOV'T, http://www.nprsr.qld.gov.au/marine-parks/gbr_coast_marine_park.html (last updated June 30, 2011), archived at <http://perma.cc/VM3H-T7ZH>. The Marine Park has the same external dimensions as the Great Barrier Reef World Heritage Area, including Queensland State coastal waters up to the low water mark, but excludes islands or parts of islands that form a part of Queensland and waters “within the limits” of Queensland. *Great Barrier Reef Intergovernmental Agreement*, AUSTL. GOV'T DEP'T OF ENV'T, <http://www.environment>.

Under the national Fisheries Management Act 1991 and Queensland's Fisheries Act 1994, the Queensland Government is also responsible for natural resource management and land use planning of the islands, the coast and the hinterland adjacent to the Great Barrier Reef World Heritage Area.⁴⁷⁸ Under the Environment Protection and Biodiversity Conservation Act 1999,⁴⁷⁹ the Commonwealth Government is responsible for regulating activities having or likely to have a significant impact on "matters of national environmental significance" as defined by the Act or on the environment within Commonwealth land and waters.⁴⁸⁰ Local watershed authorities also play a role in the implementation of the state government's protection efforts, but the Queensland Government has not delegated formal responsibility to the local authorities to the same extent that the Victoria Government has.⁴⁸¹

B. Early Stages of Great Barrier Reef Protection

The Commonwealth and the Queensland Governments have coordinated Great Barrier Reef protection since 1979 through a series of collaborative arrangements.⁴⁸² The need to address water quality, and particularly diffuse source pollution problems from agriculture, was formally recognized in 2003 in the Reef Water Quality Protection Plan (the "Reef Plan").⁴⁸³ Alarming declines in coral cover (over one percent per year over twenty-five years) from crown-of-thorns starfish outbreaks, which have affected more than 1000 of the 3000 reefs over the past sixty years, and to a lesser extent the impacts on sea grass, which affects turtle and dugong habitats, have collectively threatened the economically important Great Barrier Reef tourism industry.⁴⁸⁴

The Reef Plan identifies actions that will help minimize water quality risks, including improving land management to reduce diffuse source pollu-

gov.au/marine/gbr/protecting-the-reef/intergovernmental-agreement (last visited Nov. 17, 2014), archived at <http://perma.cc/46LD-JKQE>.

⁴⁷⁸ *Fisheries Management Act 1991* (Cth) (Austl.), available at http://www.austlii.edu.au/au/legis/cth/consol_act/fma1991193/, archived at <http://perma.cc/6F39-PA86>; *Fishery Act 1994* (Qld) (Austl.), available at <https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/F/FisherA94.pdf>, archived at <http://perma.cc/ZYY7-5WK5>.

⁴⁷⁹ *Environment Conservation and Biodiversity Act 1999* (Cth) (Austl.), available at <http://www.comlaw.gov.au/Series/C2004A00485>, archived at <http://perma.cc/ML88-K9MB>.

⁴⁸⁰ *Marine Parks Act 2004* (Qld) sch C (Austl.).

⁴⁸¹ Roberts et al., *Role of Regional Organisations*, *supra* note 293, at 150 tbl.1.

⁴⁸² *Great Barrier Reef Intergovernmental Agreement*, *supra* note 477, at 2.

⁴⁸³ AUSTRALIAN GOVERNMENT & QUEENSLAND GOVERNMENT, REEF WATER QUALITY PROTECTION PLAN 2013: SECURING THE HEALTH AND RESILIENCE OF THE GREAT BARRIER REEF WORLD HERITAGE AREA AND ADJACENT CATCHMENTS 6 (2013), available at www.reefplan.qld.gov.au/resources/assets/reef-plan-2013.pdf, archived at <http://perma.cc/TT4X-6FAF>.

⁴⁸⁴ BRODIE ET AL., *supra* note 472, at 4.

tion.⁴⁸⁵ It sets targets for improved water quality and land management practices and identifies actions needed to improve the quality of water entering the Great Barrier Reef.⁴⁸⁶ The Reef Plan aims to achieve at least a 50% reduction in the anthropogenic end-of-catchment dissolved inorganic nitrogen load, at least a 20% reduction in anthropogenic sediment and particulate nutrient loads, and at least a 60% reduction in pesticides by 2018.⁴⁸⁷ Furthermore, by 2020 the goal is to eliminate detrimental impacts on the health and resilience of the Great Barrier Reef.⁴⁸⁸ Although these targets are laudable, they are referred to as aspirational, which generally means that they are entirely unrealistic.⁴⁸⁹

In addition to the unrealistic timeframes, there is no acknowledgement in the Reef Plan of the practical limits of the best management practices (“BMPs”).⁴⁹⁰ If ambitious targets are to be achieved, land use change—including land retirement—needs to be considered.⁴⁹¹ As is still the case in the United States, land use change, and especially retirement of land from agriculture, is not politically acceptable for industry.

Nevertheless, the Reef Plan has also established a significant marine monitoring program and a paddock and watershed-modeling program to assess the ability of management practices to reduce problematic pollutant loads.⁴⁹² The program is the largest and most coordinated water quality program in Australia.⁴⁹³ It uses modeling to predict pollutant load reductions that can be achieved from particular management strategies.⁴⁹⁴ As such, its establishment provides a basis for assessing whether land management will actually result in water quality improvements.⁴⁹⁵

Queensland’s Great Barrier Reef Protection Amendment Act 2009 (the “Reef Act”) recognizes that agricultural runoff containing fertilizer, pesticides,

⁴⁸⁵ *Id.* at 18.

⁴⁸⁶ AUSTL. GOV’T & QUEENSL. GOV’T, *supra* note 483, at 7.

⁴⁸⁷ *Id.* at 18.

⁴⁸⁸ *Id.*

⁴⁸⁹ Park et al., *supra* note 459, at 288.

⁴⁹⁰ See DICKSON ET AL., *supra* note 285, at 55.

⁴⁹¹ *Id.* This is evidenced by the scenarios in Gippsland. See *supra* notes 421–436 and accompanying text.

⁴⁹² Chris Carroll et al., *A Paddock to Reef Monitoring and Modelling Framework for the Great Barrier Reef: Paddock and Catchment Component*, 65 MARINE POLLUTION BULL. 136, 136–37 (2012), available at <https://research.jcu.edu.au/research/tropwater/resources/Carroll%20et%20al%202012%20A%20paddock%20to%20reef%20monitoring.pdf>, archived at <http://perma.cc/7RWB-TAES>.

⁴⁹³ See *id.*

⁴⁹⁴ *Id.*

⁴⁹⁵ See *id.*

and sediment is damaging the Great Barrier Reef.⁴⁹⁶ Queensland enacted this legislation to “reduce the impact of agricultural activities on the quality of water entering the reef” and to “contribute to achieving the targets about water quality improvement for the reef under agreements between the State and the Commonwealth from time to time.”⁴⁹⁷ The Queensland Department of Environment and Heritage Protection (“QDEHP”)⁴⁹⁸ received a pledge of \$50 million over five years from the Queensland Government to implement the Reef Act.⁴⁹⁹ Although regulation—such as the Reef Act—is part of the Reef Plan, extension and incentive programs to encourage voluntary BMP adoption continue to be the main policy approach used.⁵⁰⁰ Nevertheless, the Reef Act is an important step towards acknowledging that voluntary actions alone will be insufficient, because it includes a regulatory program for agricultural sources of water pollution, specifies the agricultural sources that are regulated, and imposes a limited number of water quality improvement requirements on them.⁵⁰¹

For example, all farmers subject to the Reef Act must comply with fertilizer requirements.⁵⁰² The Act requires farmers to calculate the optimal amount of nitrogen and phosphorus using soil tests and applying the QDEHP’s approved methodology, to restrict application of fertilizer so that these optimum amounts are not exceeded and to keep and preserve fairly comprehensive records.⁵⁰³ In addition, before farmers apply fertilizer, they must either fulfill a number of conditions specified under the Reef Act or operate pursuant to an accredited Environmental Risk Management Plan (“ERMP”).⁵⁰⁴

The Reef Act lays out numerous requirements and guidelines for ERMPs.⁵⁰⁵ Notably, ERMPs must also address all contaminants that the farm

⁴⁹⁶ *Great Barrier Reef Protection Amendment Act 2009* (Qld) (Austl.), available at <https://www.legislation.qld.gov.au/LEGISLTN/ACTS/2009/09AC042.pdf>, archived at <http://perma.cc/N7GV-A77R>.

⁴⁹⁷ *Id.* s 6 (amending *Environmental Protection Act 1994* (Qld) s 74 (Austl.)).

⁴⁹⁸ *About Us*, QUEENSL. GOV’T DEP’T OF ENV’T & HERITAGE PROT., <http://www.ehp.qld.gov.au/about/index.html> (last updated June 5, 2014), archived at <http://perma.cc/4SLJ-UXKE> (QDEHP, who “aims to be the most responsive and respected environment and heritage protection agency in Australia, and is responsible for managing the health of the environment to protect Queensland’s unique ecosystems, including its landscapes and waterways, as well as its native plants and animals and biodiversity”).

⁴⁹⁹ AUSTL. GOV’T & QUEENSL. GOV’T, *supra* note 483, at 11.

⁵⁰⁰ *Id.*

⁵⁰¹ *Great Barrier Reef Protection Amendment Act 2009* (Qld) (Austl.).

⁵⁰² *Id.* s 6 (Austl.) (amending *Environmental Protection Act 1994* (Qld) s 75 (Austl.)).

⁵⁰³ *Id.* (amending *Environmental Protection Act 1994* (Qld) ss 81–84 (Austl.)). QDEHP can demand these records for inspection through proper procedures. *Id.* (amending *Environmental Protection Act 1994* (Qld) s 85 (Austl.)).

⁵⁰⁴ *Id.* (amending *Environmental Protection Act 1994* (Qld) s 78 (Austl.)). That provides an alternative nutrient application procedure that provides the same level of protection. *Id.*

⁵⁰⁵ *Id.* (amending *Environmental Protection Act 1994* (Qld) ss 94–96 (Austl.)).

could potentially release into the Great Barrier Reef, including sediments, pesticides, and nutrients.⁵⁰⁶ All ERMPs must be submitted to the QDEHP for accreditation.⁵⁰⁷ In addition, all farmers working from accredited ERMPs must submit yearly reports to the QDEHP.⁵⁰⁸

These requirements are modest and are unlikely to achieve the target pollutant reductions.⁵⁰⁹ Nevertheless, they have begun the process of requiring specific diffuse sources to implement particular measures that will improve water quality on the Great Barrier Reef, thus introducing the agricultural pollutants in the catchment to the very idea of water quality regulation of diffuse source pollution.⁵¹⁰

C. Diffuse Source Regulation in Queensland: Implementation of the Law

Implementation of the Great Barrier Reef Protection Act 2009 has largely stalled with the election of a conservative, pro-agriculture, pro-development Queensland Government in 2012.⁵¹¹ The leading Australian sugarcane industry group, Canegrowers, successfully lobbied the Queensland Government to adopt the “Smartcane” BMP approach, which is made up of seven management modules.⁵¹² The Smartcane approach involves industry self-assessment, industry certification on a five-year basis, industry auditing, and random independent auditing, the details of which are unclear.⁵¹³

Unsurprisingly, Canegrowers suggests that the Smartcane BMP is “a far more effective approach to industry change than regulations as it focuses on the business of sugarcane and delivers the environmental outcomes that will meet the expectations of the Australian community.”⁵¹⁴ As key milestones of

⁵⁰⁶ *Id.* (amending *Environmental Protection Act 1994* (Qld) s 94 (Austl.)).

⁵⁰⁷ *Id.* (amending *Environmental Protection Act 1994* (Qld) s 97 (Austl.)).

⁵⁰⁸ *Great Barrier Reef Protection Amendment Act 2009* (Qld) s 6 (Austl.) (amending *Environmental Protection Act 1994* (Qld) s 105 (Austl.)).

⁵⁰⁹ *See id.* (amending *Environmental Protection Act 1994* (Qld) ss 94, 97, 105 (Austl.)).

⁵¹⁰ *See id.*

⁵¹¹ *See ‘We’re in the Coal Business’: Campbell Newman Slams UNESCO Great Barrier Reef Warning*, NEWS.COM.AU (June 2, 2012, 6:25 PM), <http://www.news.com.au/national/unesco-slams-great-barrier-reef-management-youve-got-eight-months-to-fix-it/story-e6frfkwo-1226381188474>, archived at <http://perma.cc/DMW9-V2RV>.

⁵¹² *About Us*, CANEGROWERS, http://www.canegrowers.com.au/page/Industry_Centre/About_Us/ (last visited Nov. 13, 2014), archived at <http://perma.cc/4J9C-9JBH>; *Latest News in the Smartcane BMP Project*, CANEGROWERS, http://www.canegrowers.com.au/page/Industry_Centre/bmp/Latest_news_in_the_Sugarcane_BMP_project/ (last visited Nov. 13, 2014), archived at <http://perma.cc/V6W2-3DJC>.

⁵¹³ CANEGROWERS, AUDITING AND CERTIFICATION FACTSHEET (2012), available at http://www.canegrowers.com.au/icms_docs/180305_Auditing_and_certification_fact_sheet.pdf, archived at <http://perma.cc/CPB9-G98R>.

⁵¹⁴ *Latest News in the Smartcane BMP Project*, *supra* note 512.

the project are met, the Queensland Government has committed to rolling back the regulatory controls.⁵¹⁵

In addition to nutrient and sediment issues, even Queensland's pesticide regulation has been suggested to be inadequate.⁵¹⁶ The only regulatory action Queensland has taken to date has been to restrict conditions of use for particular chemical products, and this has occurred outside of Australia's dedicated regulatory regime for managing pesticide risks.⁵¹⁷ Researchers have concluded that the ad hoc chemical review process administered by Australia's national pesticide regulator has not effectively assessed or addressed chemical risks to the Great Barrier Reef.⁵¹⁸ According to researchers, both the special management provisions for the area already existing, plus an effective national pesticide regulatory regime using European Union standards, are the minimum requirements necessary to protect the Great Barrier Reef.⁵¹⁹

Overall, it appears that Queensland has not learned from the experiences of other countries regarding voluntary adoption of BMPs: that voluntary programs tend to be inadequate to protect and improve water quality affected by diffuse pollution sources.⁵²⁰ The Australian Government, given its international obligations and co-management responsibilities for the Great Barrier Reef, could also do much more to honor and demonstrate its real commitment to achieving positive environmental outcomes.⁵²¹

⁵¹⁵ *Id.* The language about regulations on the current Queensland government website further illustrates the extent of the backsliding:

Existing regulations will stay in place as reference points for cane and grazing industry practice as producers transition to [BMP] systems. Just as under regulation, BMPs will deliver accountable reporting of industry progress towards Reef Plan water quality targets. We expect there will be less need for regulation once there is high adoption of BMP systems across the reef catchments, but the regulations will remain in place until BMP has effect. Under a BMP system, industry is responsible for benchmarking the performance of its producers. Staff from the environment and agriculture departments will continue to engage with producers to address the issues of most concern to their business under the BMP process.

Reef Regulations, QUEENSL. GOV'T, <http://www.qld.gov.au/environment/agriculture/sustainable-farming/reef-legislation/> (last updated Nov. 28, 2013), archived at <http://perma.cc/F3CF-7RF3>.

⁵¹⁶ Juliette King et al., *Regulation of Pesticides in Australia: The Great Barrier Reef as a Case Study for Evaluating Effectiveness*, 180 AGRIC., ECOSYSTEMS & ENV'T 54, 54 (2013), available at <http://www.sciencedirect.com/science/article/pii/S0167880912002526>.

⁵¹⁷ *Id.*

⁵¹⁸ *Id.*

⁵¹⁹ *Id.*

⁵²⁰ *Id.*

⁵²¹ *See id.*

CONCLUSION

Nonpoint source pollution is a recognized source of water quality degradation in both Australia and the United States. Nevertheless, despite the striking scientific knowledge about the effects of nonpoint source pollution, governmental willingness in both countries to address nonpoint source pollution has been tied instead to the cultural, economic, and political salience of perceived nonpoint source pollution problems, particularly with respect to agriculture. As the American experience over the past century has demonstrated, to mitigate water quality problems in Australia through regulatory reform, there needs to be much stronger leadership at the state and national levels. Without such improved leadership and increased regulation, Australia's environment—including the internationally famed Great Barrier Reef—will likely degrade beyond repair.

Although the regulatory history of nonpoint source pollution in the United States is more evolved than Australia's, the United States still suffers from substantial environmental problems caused by nonpoint source pollution. Despite the efforts of many U.S. states to regulate the relevant sources, there has been, and continues to be, strong resistance from the powerful lobbies of big agriculture and urban developers. State governments and the federal government have relied too heavily on voluntary programs, which are unlikely to produce the desired water quality outcomes. There is a need for reform to further attribute and clarify regulatory responsibility and financial commitment for nonpoint source pollution control.

In Australia, as in the United States, a particular state's willingness to address nonpoint source pollution appears to be tied to the cultural, economic, and political salience of perceived nonpoint source pollution problems. Based on lessons learned from the history of nonpoint source pollution regulation in the United States, Australia's federal government needs to take a much stronger leadership approach and address its national and international obligations with respect to water quality. Further, regulatory reform—particularly reform to increase the powers of Australian state and local agencies that are equivalent to the U.S. Environmental Protection Agency and its state agency counterparts—is crucial.

The United States' water quality improvement efforts have benefitted tremendously both from cooperative federalism and citizen involvement. Without citizen suits and more intergovernmental interaction, Australian states like Victoria and Queensland are failing to protect the environment from increasing and known water quality problems.

Further, and somewhat perversely, even with the appropriate legal tools, Australia still lacks the kinds of conflicts over water quality that result in stakeholder demands for improvement. In the United States, threats to drinking

water supplies, recreation, and culturally important resources such as salmon have historically been important drivers of water quality improvements—local and national. Moreover, the existence of significant and conflicting political and economic interests in improved water quality has been an important, if not crucial, factor in enabling states that have implemented more serious nonpoint source regulation to do so.

As the Chesapeake Bay and the Florida Everglades have demonstrated, large and obviously imperiled charismatic ecosystems can also help to drive improvements in nonpoint source regulation. In Australia, the Great Barrier Reef is the most likely rallying point for increasing agricultural nonpoint source regulation. There has been markedly increased investment in programs to protect the Reef, which is a positive sign that public pressure may further incite increased government intervention. Nevertheless, and despite the fact that the Queensland Government has taken the first small steps towards more robust nonpoint source regulation, vested agricultural interests and the election of conservative governments at both the state and federal levels have had a regressive effect on those efforts.

Just as the United States Federal Government stepped into full-scale water quality regulation in 1972, the Australia National Commonwealth Government needs to increase its leadership role in water quality regulation when nonpoint source pollution threatens its interests. Through reforms in the Murray-Darling Basin, the Australian Government has shown that it has the capacity to act to protect water resources and the ecosystems that depend on them. The Great Barrier Reef is the Commonwealth Government's most logical next point of focus, because nowhere is its involvement more critical than to help address water quality threats to the greatest of Australia's natural assets.