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The Semicommons and Wisconsin Water Quality

David A. Strifling

THE SEMICOMMONS AND WISCONSIN WATER QUALITY

DAVID A. STRIFLING*

INTRODUCTION

From the Great Lakes to pristine northern streams, Wisconsin boasts a plentiful and valuable array of water resources. Yet water stress analyses show that this natural capital is deeply threatened in a variety of ways. The pressure

* Director, Water Law and Policy Initiative, Marquette University Law School.

results primarily from human activity, ranging from general overuse to colonization by anthropogenically introduced non-native species. Some of the greatest water quality problems, however, are caused by land use practices that lead to polluted runoff from farm fields and urban settings. The onset of climate change has the potential to further exacerbate all of this. These issues, coupled with the failure of existing law to effectively address them, confront regulators and policy makers with difficult and novel questions. As a result, the next century will demand innovative approaches to preserve the quality and quantity of Wisconsin's water resources for both public and private purposes.

The opening question is basic: Who bears responsibility to address these emerging problems? As an initial matter, under both statutory and common law, it is the state. Federal and state environmental laws vest it with that authority, to the extent of their coverage. The public trust doctrine, long established in our courts, likewise charges the state with protecting water resources for current and future generations of Wisconsin citizens to use for navigation, fishing, hunting, recreation, and scenic beauty. But the scope of the environmental laws is limited, and recent developments in the Wisconsin Legislature and court system have further curtailed the state's power. For example, the Wisconsin Supreme Court clarified that the public trust doctrine does not apply to land use practices, thereby limiting its usefulness as a water quality protection tool.[1]

One approach to this dilemma is to recognize that federal and state government regulators, acting alone under current law, can no longer fully protect water quality. New laws that fill the gap seem unlikely, meaning that responsible engagement by local governments and private entities will be essential.

Professor Henry Smith has already proposed that the law should treat water much like intellectual property rights—as a "semicommons."[2] Smith argues that exclusionary governance regimes are a poor fit for "fluid resources" and instead calls for hybrid systems that combine private and common elements of property.[3] Smith's theory—at least as he has expressed it to date—relates primarily to private rights to use water under various legal systems currently in place. But a broader conceptualization is also useful. If private entities have a right to use water, they should also share a corresponding responsibility to maintain the resource. Water quality is important for public and private uses alike. This article will explore whether the semicommons approach could be expanded to justify a more inclusive approach to responsibility for water quality

1. Rock-Koshkonong Lake District v. DNR, 833 N.W.2d 800, 820–21 (Wis. 2013).
2. *See infra* Section III.A.
3. *See infra* Section III.A.

concerns in addition to private use rights. Innovative proposals along those lines could include involvement by local governments, including cities and counties; voluntary programs; and even private sector involvement in water quality preservation through increased grant or cost-sharing efforts, public educational campaigns, limited public-private partnerships, and other mechanisms. To be sure, this private role must come with safeguards that protect the resource and simultaneously encourage broad participation.

I. ARRAY OF WATER RESOURCES CHALLENGES FACING WISCONSIN

Wisconsin's water resources have been negatively affected by "nonpoint" source pollution, invasion by non-native species, and groundwater overuse and depletion, among other threats.[4] Climate change will further affect our resources in unexpected ways.

A. Nonpoint Source Pollution

Perhaps the greatest threat to Wisconsin water quality comes from nonpoint source pollution, meaning that it does not originate from traditional "end-of-pipe" sources. Rather, it emanates from diffuse sources washed by precipitation over the land into surface waters.[5] Examples include urban runoff from paved areas such as roads and parking lots containing oil and grease, sediment from poorly managed construction sites, and runoff containing excess fertilizers, herbicides, and insecticides from agricultural lands as well as bacteria and nutrients from livestock operations.[6] Contributing agricultural practices may include poorly located or managed animal feeding operations, overgrazing, plowing errors, and improper application of pesticides, fertilizer,

4. The World Resources Institute's popular "Aqueduct" project measures and maps water risks from the global to the local scales. *See Aqueduct Measuring and Mapping Water Risk*, WORLD RESOURCES INSTITUTE, http://www.wri.org/our-work/project/aqueduct [https://perma.cc/R9L6-WUCE] (last visited Oct. 2, 2017). The project results showed most of Wisconsin under either "extremely high risk" or "high risk" for water quality impacts. *Id.*

5. *See* Thomas C. Brown & Pamela Froemke, *Nationwide Assessment of Nonpoint Source Threats to Water Quality*, 62 BIOSCIENCE 136, 136 (2012).

6. U.S. Envtl. Prot. Agency, *What is Nonpoint Source?*, EPA.GOV https://www.epa.gov/nps/what-nonpoint-source [https://perma.cc/VC46-Z6X3] (last updated May 2, 2017); *see also* Wis. Dep't of Natural Resources, *Nonpoint Source Pollution*, http://dnr.wi.gov/topic/nonpoint/ [https://perma.cc/S5EU-82BA] (last updated Jan. 5, 2017). In 1987, as the federal government tried to strengthen federal efforts to regulate nonpoint source pollution (see Section II.A, *infra*), EPA issued guidance defining nonpoint source pollution as "caused by diffuse sources that are not regulated as point sources and normally is associated with agricultural, silvicultural and urban runoff, runoff from construction activities, etc. In practical terms, nonpoint source pollution does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition, or percolation." U.S. ENVTL. PROT. AGENCY OFFICE OF WATER, NONPOINT SOURCE GUIDANCE 3 (1987).

and irrigation water.[7]

The impacts of nonpoint source pollution on water quality can be severe. State-level data compiled by United States Environmental Protection Agency (EPA) shows that agricultural nonpoint source pollution is the leading source of water quality impacts on rivers and streams, the third-largest source of such impacts on lakes, the second-largest source of wetland impairment, and a frequent contributor to groundwater contamination.[8] Excess nutrients from agricultural runoff can cause increased nitrogen and phosphorus levels in surface waters, resulting in algal blooms and lower dissolved oxygen levels for aquatic life.[9]

At the state level, nonpoint pollution is "a leading cause of water quality problems in Wisconsin."[10] It is a source of impairment to about 58% of impaired waters listed under Section 303(d) of the Clean Water Act (CWA).[11] Even worse, excess agricultural runoff containing "[m]anure, fertilizers, pesticides, herbicides and pharmaceuticals may pollute groundwater."[12] This problem is especially severe in Kewaunee County, Wisconsin, where at least one-third of wells are unsafe for use as a drinking water source, partially due to manure overspreading in agricultural settings.[13]

B. Non-Native Species

Wisconsin waters—and especially the Great Lakes—are also threatened with a hostile takeover by non-native (sometimes called "invasive") species. Defining exactly what that means can be difficult. By some definitions, an "invasive species" is any non-native species.[14] But a more nuanced definition

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7. *See generally* EPA, *supra* note 6.

8. U.S. Envtl. Prot. Agency, *Nonpoint Source: Agriculture*, EPA.GOV https://www.epa.gov/nps/nonpoint-source-agriculture [https://perma.cc/2JJE-DZWD] (last updated Aug. 18, 2017); Robin K. Craig and Anna M. Roberts, *When Will Governments Regulate Nonpoint Source Pollution? A Comparative Perspective*, 42 B.C. ENVTL. AFF. L. REV. 1, 3, 37 (2015).

9. Wis. Dep't of Natural Resources, ENVIRONMENTAL IMPACTS OF AGRICULTURAL RUNOFF, http://dnr.wi.gov/topic/Nonpoint/AgEnviromentalImpact.html [https://perma.cc/L7YT-K3GF].

10. Wis. DNR, *supra* note 6.

11. WIS. DEP'T OF NATURAL RESOURCES, WISCONSIN'S NONPOINT SOURCE PROGRAM MANAGEMENT PLAN FFY 2016–2020, 24 (2015).

12. Wis. Dep't of Natural Resources, *Environmental Impacts of Agricultural Runoff,* http://dnr.wi.gov/topic/Nonpoint/AgEnviromentalImpact.html [https://perma.cc/DEK5-QSV4] (last updated May 26, 2015).

13. Lee Bergquist, *One-Third of Wells in Kewaunee County Unsafe for Drinking Water*, MILWAUKEE JOURNAL SENTINEL (Dec. 21, 2015), http://archive.jsonline.com/news/statepolitics/one-third-of-wells-in-kewaunee-county-unsafe-for-drinking-water-b99636500z1-363176361.html/ [https://perma.cc/58D9-Y4HL].

14. U.S. Envtl. Prot. Agency, *Invasive Species*, https://www.epa.gov/greatlakes/invasive-species [https://perma.cc/AQ5M-JUE8] (last updated Aug. 14, 2017).

is increasingly appropriate—an "invasive species" is a non-native species "whose introduction does or is likely to cause economic or environmental harm or harm to human health."[15]

The latter definition makes plain that not all non-native species are invasive. Most non-native species cause no economic or environmental harm; indeed, many are beneficial, including cattle, wheat, soybeans, and tulips.[16] Nevertheless, under any definition, some "invasive" species certainly are a problem for the Great Lakes region. The National Oceanic and Atmospheric Administration estimates that "[t]he Great Lakes ecosystem has been severely damaged by more than 180 invasive and non-native species."[17] The best-known invaders, such as the zebra mussel, quagga mussel, sea lamprey, and alewife, "degrad[e] habitat, out-compet[e] native species, and short-circuit[ ] food webs."[18] The impact on diverse industries including commercial and sport fishing, tourism, and even agriculture can be severe; recent estimates put the economic damages at "significantly over $100 million annually."[19]

Moreover, such economic damage estimates do not fully value the nonmonetary damages involved in the displacement of native organisms or the destruction of ecosystems.[20] Costs typically not considered include the impact on natural ecosystems, the extinction of native species, lost water-purification capability, aesthetic and recreational impacts, and weakened resistance to impacts of invasions by other species in the future.[21] When damage to those

15. Exec. Order No. 13,112, 64 Fed. Reg. 6183, 6183 (Feb. 3, 1999). The Order was intended to "prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause." *Id.*

16. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-03-1, INVASIVE SPECIES: CLEARER FOCUS AND GREATER COMMITMENT NEEDED TO EFFECTIVELY MANAGE THE PROBLEM 8 (2002) (*hereinafter* GAO); *see also* NAT'L INVASIVE SPECIES COUNCIL, 2008-2012 NATIONAL INVASIVE SPECIES MANAGEMENT PLAN 4 (2008) ("Most nonnative species . . . are not harmful; and many are highly beneficial.").

17. Nat'l Oceanic and Atmospheric Admin., *Invasive Species: Great Lakes Region*, http://www.regions.noaa.gov/great-lakes/index.php/great_lakes-restoration-initiative/invasive-species/ [https://perma.cc/4DNJ-X9NG] (last visited Oct. 3, 2017). The Environmental Protection Agency estimates that this includes at least twenty-five species of invasive fish along with many invasive plants. U.S. EPA, *supra* note 14.

18. NOAA, *supra* note 17. For an outstanding and detailed discussion of the history and impact of invasive species in the Great Lakes, *see* DAN EGAN, THE DEATH AND LIFE OF THE GREAT LAKES 1-150 (W.W. Norton & Co. 2017).

19. Alex L. Rosaen et al., *The Costs of Aquatic Invasive Species to Great Lakes States*, THE NATURE CONSERVANCY 1 (Mar. 5, 2012), https://www.nature.org/ourinitiatives/regions/northamerica/areas/greatlakes/ais-economic-report.pdf [https://perma.cc/5KSZ-KFVE].

20. GAO, *supra* note 16, at 13. "Most economic estimates do not consider all of the relevant effects of nonnative species or the future risks that they pose." *Id.* at "*Highlights of GAO-03-1"*.

21. *Id.* at 13, 23, 55; John D. Rothlisberger et al., *Ship-Borne Nonindigenous Species Diminish Great Lakes Ecosystem Services*, 15 ECOSYSTEMS 462, 462 (2012).

"ecosystem services" are considered, the economic toll on the Great Lakes may rise to $800 million annually.[22]

C. Groundwater Overuse and Depletion

More than twenty percent of Wisconsin's land area lies within the Great Lakes basin.[23] Vast tracts of the state, therefore, do not have access to Great Lakes water and largely depend on groundwater for municipal and industrial supplies. As a matter of hydrogeology, groundwater pumping lowers water levels in connected bodies of water, sometimes other groundwater but more often streams and other surface waters.[24] In some areas, groundwater overuse has led to significant consequences for those connected waters. This section discusses two examples: the Central Sands region of the state and the City of Waukesha.

1. Central Sands

In the United States, irrigated agriculture is sometimes thought to be mostly localized to the arid western states. Increasingly, this is untrue; "[i]rrigated agriculture has expanded greatly in the water-rich U.S. northern lake states during the past half century."[25] Such "supplemental" irrigation, while not necessary for crop survival, augments production and extends the growing season.[26] However, this practice can create significant environmental challenges when groundwater is shallow and closely connected to local surface waters.[27]

Those tight connections between surface and ground waters are present in Wisconsin's "central sands," a region that encompasses about 1.75 million

22. Rothlisberger, *supra* note 21. "Ecosystem services" are services provided by natural systems that were historically not valued in markets because of their nature as public goods. Laurie A. Wayburn & Anton A. Chiono, *The Role of Federal Policy in Establishing Ecosystem Service Markets*, 20 DUKE ENVTL. L. & POL'Y F. 385, 385 (2010). Increased recognition of their value has led to increasing calls to remedy this exclusion. *See generally id.*

23. Wis. Dep't of Natural Resources, *Wisconsin's Great Lakes*, https://www.dnr.wi.gov/topic/Greatlakes/learn.html [https://perma.cc/38BG-MG2Q] (last updated May 3, 2017).

24. *See, e.g.*, Sharon Megdal et al., *The Forgotten Sector: Arizona Water Law and the Environment*, 1 ARIZ. J. ENVTL. L. & POL'Y 243, 276 (2011) ("groundwater pumping . . . creates a 'cone of depression'" in the water table surrounding a well); Jack Tuholske, *Trusting the Public Trust: Application of the Public Trust Doctrine to Groundwater Resources*, 9 VT. J. ENVTL. L. 189, 202 (2008) ("[G]roundwater is often directly connected to surface water [and] pumping can seriously affect the amount of water that would otherwise remain in rivers, lakes, springs, and wetlands.").

25. George J. Kraft et al., *Irrigation Effects in the Northern Lake States: Wisconsin Central Sands Revisited*, 50 GROUNDWATER 308, 308 (2012) (*hereinafter* Kraft (2012)).

26. *Id.*

27. *Id.*

acres overlying a shallow glacial aquifer in parts of Adams, Marathon, Marquette, Portage, Shawano, Waupaca, Waushara, and Wood counties.[28] In many parts of the region, the aquifer lies only a few feet below the ground.[29] The region contains over 800 miles of high-quality "trout streams"[30] and over 300 lakes, most of which are largely sourced from groundwater.[31]

As of 2010, over 2300 high capacity wells[32] irrigate about 200,000 acres in the Central Sands region.[33] The number of wells, and the acreage served, has grown significantly in recent decades.[34] Meanwhile, surface water levels and stream discharges have been substantially lower, and some lakes and streams substantially disappear during dry seasons.[35] The question, of course, is whether these two phenomena are connected.

Recent studies conclusively show that they are. A well-researched 2012 report found that "[i]rrigation stresses are sufficient to explain the previously rare or never before observed low-water conditions that have prevailed since 2000 in the Wisconsin central sands."[36] Precipitation during the same period was at average or slightly below average levels, ruling out a drought as the likely cause of the lower levels.[37] Over one-third of the base flow of some streams has been diverted due to groundwater pumping for agriculture.[38] The increased pumping activities cause a net "recharge reduction" sufficient to explain the drastic decreases in surface water levels.[39]

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28. WIS. DEP'T OF NATURAL RESOURCES, CENTRAL WISCONSIN SAND AND GRAVEL AQUIFER: MANAGING WATER FOR MULTIPLE USES 1 (2013).

29. *Id*.

30. "Trout streams" are generally defined to include streams that contain either a self-sustaining trout population, a trout population that may become self-sustaining, or a stream with habitat of sufficient quality to be stocked with trout to provide trout fishing. *See* WIS. ADMIN. CODE DNR § NR 820.12(2)–(4) (2017) (defining Class 1, Class 2, and Class 3 trout streams). Wisconsin regulations direct the Department of Natural Resources to take into account the existence of such streams when considering and approving applications for new high capacity wells. WIS. ADMIN. CODE DNR § NR 820.30(1) – (2) (2017).

31. Wis. DNR, *supra* note 23, at 1.

32. WIS. STAT. § 281.34(1)(b) (2015–2016) (A "high capacity well" is "a well . . . that, together with all other wells on the same property . . . has a capacity [to pump] more than 100,000 gallons per day."); *see also* WIS. ADMIN. CODE DNR § NR 820.12(11) (2017).

33. GEORGE J. KRAFT & DAVID J. MECHENICH, *Groundwater Pumping Effects on Groundwater Levels, Lake Levels, and Streamflows in the Wisconsin Central Sands*, at iii (2010) (*hereinafter* Kraft (2010)).

34. *Id.*

35. *Id.*

36. Kraft (2012), *supra* note 25, at 316.

37. *Id.*

38. *Id.*

39. *Id.* "Recharge reduction" means a decrease in the amount of water recharging groundwater levels and is often caused by changes in land use. *See* Hasan M. Hameed, *et al.*, *Impacts of Urban*

2. Waukesha, Wisconsin, and the Great Lakes Compact

The story of the water supply in Waukesha, Wisconsin is a textbook example of how overuse slowly degrades a resource. Over a century ago, Waukesha became known as "Spring City" for the quality of its spring water, known nationwide and even believed by some to have healing properties.[40] As Waukesha grew, so did the demand on its wells. The eventual "mining" of the aquifer resulted in plummeting water levels and increasing contamination.[41] Eventually, levels of radium—a carcinogen—in the deep aquifer came to far exceed federal drinking water standards.[42] In 2003, city leaders signed a consent order with the State of Wisconsin and agreed to take "steps to achieve compliance with state radionuclide requirements" by December 2006.[43] As to federal standards, the EPA ordered Waukesha to find a safe water supply by 2018.[44] These legal and practical circumstances resulted in Waukesha deciding to abandon its historic springs, and turn to the comparatively abundant freshwater resource about twenty miles to its east—the Great Lakes.

Before it could tap the Great Lakes for its public water supply, however, Waukesha faced a legal hurdle—the Great Lakes Compact.[45] The Compact, an agreement between Wisconsin and the other Great Lakes states, generally operates as a ban on new and increased diversions of Great Lakes water outside the Great Lakes basin, with certain limited exceptions.[46] One of those exceptions allows communities located outside the basin, but within counties that straddle the basin line, to apply for a diversion.[47] Waukesha is the first community to seek that exception,[48] and its application drew close attention

Growth on Groundwater Levels Using Remote Sensing- Case Study: Erbil City, Kurdistan Region of Iraq, 5 J. Nat. Sci. Research 72, 72 (2015).

40. *See generally* Egan*, supra* note 18, at 256–64.

41. *See generally* Christina L. Wabiszewski, *Diversions from the Great Lakes: Out of the Watershed and in Contravention of the Compact*, 100 MARQ. L. REV. 627, 646 (2016); *see also* Egan, *supra* note 18, at 264.

42. Wabiszewski, *supra* note 41, at 646–47.

43. *Id.* at 647.

44. Id.

45. The Great Lakes Compact has been enacted by the state legislatures of all member states, approved by Congress, and was signed by then-President George W. Bush on Oct. 3, 2008. *See, e.g.*, WIS. STAT. § 281.343 (2015–16); Wabiszewski, *supra* note 43, at 639.

46. WIS. STAT. § 281.343(4m) ("All new or increased diversions are prohibited" with certain exceptions); *see generally* Amanda K. Beggs, *"Death by a Thousand Straws": Why and How the Great Lakes Council Should Define "Reasonable Water Supply Alternative" Within the Great Lakes Compact*, 100 IOWA L. REV. 361, 365, 370–71 (2014).

47. *See* WIS. STAT. § 281.343(4n)(c) (communities in counties that straddle the basin line may apply for an exception to the general prohibition on diversions, provided certain conditions are met).

48. Wabiszewski, *supra* note 41, at 634.

locally and nationally.[49] Under the Compact, Waukesha had to demonstrate, among other things, that it had "no reasonable water supply alternative," that its need could not be reasonably avoided through the efficient use and conservation of existing water supplies, that the diversion would be limited to a "reasonable" amount of water, and that it would cause no significant impacts to the quantity or quality of the basin waters.[50] All eight Great Lakes states had the opportunity to veto the application.[51] Fortunately for Waukesha, none did—the Compact Council approved its application in June 2016,[52] and the approval survived a subsequent legal challenge by the Great Lakes and St. Lawrence Cities Initiative.[53]

These case studies serve as cautionary tales; without intervention, they may herald a looming threat for other parts of Wisconsin that depend on groundwater. Waukesha took advantage of an exception in the Great Lakes Compact to secure a more stable water supply, but other communities will certainly not be so fortunate.

D. Climate Change and Water Resources

The onset of climate change will pose many challenges for water resources management.[54] These may include climatic impacts such as droughts and floods, as well as corresponding impacts to agriculture and food security, public health impacts, and environmental impacts on ecosystems and species.[55] A

49. *See, e.g.*, Monica Davey, *Waukesha Plan for Lake Michigan Water Raises Worries*, N.Y. TIMES (Aug. 25, 2015), https://www.nytimes.com/2015/08/26/us/waukesha-plan-for-lake-michigan-water-raises-worries.html?_r=0 [https://perma.cc/F4LB-C6A2].

50. WIS. STAT. §§ 281.343(4n)(c)(1)(d), (4n)(d)(1), (2), (4).

51. WIS. STAT. § 281.343(4n)(c)(1)(g) ("Council approval shall be given unless one or more council members vote to disapprove.").

52. Application by the City of Waukesha, Wisconsin for a Diversion of Great Lakes Water from Lake Michigan and an Exception to Allow the Diversion, No. 2016-1 (Great Lakes-St. Lawrence River Basin Water Res. Council June 21, 2016) (final decision) http://www.glslregionalbody.org/Docs/Waukesha/Waukesha—Final%20Decision%20of%20Compact%20Council%206-21-16.pdf [https://perma.cc/6JQ3-7SE6].

53. *See* City of Waukesha, No. 2016-1 (Great Lakes-St. Lawrence River Basin Water Res. Compact Council May 4, 2017) (opinion) http://www.glslregionalbody.org/Docs/Waukesha/Compact%20Council%20Opinion%20on%20GLSLCI%20Request%20for%20Hearing%205-4-17.pdf [https://perma.cc/SC52-TZUD]. The Cities Initiative generally argued that the public input process was inadequate and that Waukesha had a "reasonable water supply alternative" that could have avoided the need for the diversion. *Id.* It also repeatedly expressed a concern that granting Waukesha's application would set a negative precedent authorizing future "straws in the lake." *Id.*

54. *See generally* Gabriel Eckstein, *Water Scarcity, Conflict, and Security in a Climate Change World: Challenges and Opportunities for International Law and Policy*, 27 WIS. INT'L L.J. 409 (2009); Dustin Charapata, Conference Report, *Climate and Water Policy: When is the Right Time to Adjust Course?*, 14 U. DENV. WATER L. REV. 425 (2011); U.S. ENVTL. PROT. AGENCY, NATIONAL WATER PROGRAM 2012 STRATEGY: RESPONSE TO CLIMATE CHANGE (2012).

55. Eckstein, *supra* note 54 at 415–16, 419–24.

detailed examination of these impacts is beyond the scope of this paper. Wisconsin will certainly not be immune. Impacts here will likely include increased flooding and degraded water quality.[56] The University of Wisconsin's Water Sustainability and Climate Project has simulated an innovative set of scenarios that explore how our region may respond to the potentially devastating impacts associated with climate change.[57]

II. EXISTING LEGAL REGIMES CANNOT MEET THESE CHALLENGES

The problems described in the previous section have the potential to devastate the Great Lakes and the population that relies on them. Yet existing federal and state laws and regulations are inadequate to respond, as described in the following sections.

A. Nonpoint Source Pollution: The Elephant That Fell Through the Cracks

Nonpoint source pollution presents difficult regulatory challenges because of problems in identifying its origin and magnitude over time. Despite widespread recognition that it is the leading source of water quality impairments, current regulatory approaches have been almost completely unsuccessful in controlling water quality impacts from nonpoint sources.[58]

Multiple levels of government play a role in nonpoint source management. Traditionally, decisions about water allocation and management have been left to the states.[59] By the early 1970s, however, the federal government took on an increasing role in pollution control. The bellwether of federal water protection laws, the Clean Water Act ("Act"), is intended to "restore and maintain the chemical, physical, and biological integrity of the Nation's

56. U.S. Envtl. Prot. Agency, *What Climate Change Means for Wisconsin* (Aug. 2016). This document has been removed from EPA's current website but is temporarily available at https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-wi.pdf [https://perma.cc/H4S7-ADYM] and is also on file with the author.

57. *See* Univ. of Wis. Water Sustainability and Climate Project, *Yahara 2070*, WISC.EDU, https://wsc.limnology.wisc.edu/yahara2070/about-yahara-2070 [https://perma.cc/4BUA-TDZA] (last visited Oct. 3, 2017).

58. Elizabeth Ann Kronk Warner, *Examining Tribal Environmental Law*, 39 COLUM. J. ENVTL. L. 42, 85 (2014); Sonya Dewan, *Emissions Trading: A Cost-Effective Approach to Reducing Nonpoint Source Pollution*, 15 FORDHAM ENVTL. L. REV. 233, 234 (2004). In contrast, the Clean Water Act has been very successful in reducing pollution from point sources. Warner, *supra*, at 85.

59. *See, e.g.,* James L. Huffman, *Comprehensive River Basin Management: The Limits of Collaborative, Stakeholder-Based, Water Governance*, 49 NAT. RESOURCES J. 117, 117 (2009) (citing a "tradition of federal deference to state responsibility for water allocation and management"); Alexandra Campbell-Ferrari, *Managing Interstate Water Resources: Tarrant Regional and Beyond*, 44 TEX. ENVTL. L.J. 235, 235–36 (2014) ("issues of water resources management have been left in the hands of states").

waters,"[60] and serves as the primary source of federal authority over water pollution.[61] The core of the Act prohibits the "discharge of any pollutant by any person" from any "point source" to navigable waters, except as authorized by permit.[62] The precise meanings of these terms have provoked much litigation, but at issue here is the Clean Water Act's regulation—or lack thereof—of *nonpoint* source pollution.

The term "nonpoint source" is not defined in the Clean Water Act and has generally been taken to mean all sources other than point sources.[63] Unlike point sources, nonpoint sources are not subject to the national permit system.[64] Instead, the statute as initially drafted "leaves the regulation of nonpoint source pollution to the states."[65] For example, Section 208 directs the states to develop "areawide waste treatment management plans" to, among other things,

> Identify . . . agriculturally and silviculturally related nonpoint sources of pollution, including return flows from irrigated agriculture, and their cumulate effects, runoff from manure disposal areas, and from land used for livestock and crop production, and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources.[66]

Courts have consistently interpreted the statute this way since its passage.[67] After states largely failed to control nonpoint pollution, in 1987, Congress created a new section of the Clean Water Act intended to incentivize them to do so.[68] Rather than taking a regulatory approach, as with point sources, Congress created a grant program that provides funds to states that develop and implement nonpoint source management programs. Specifically, Section 319

60. 33 U.S.C. § 1251(a) (2012).

61. *Waterkeeper Alliance, Inc. v. U.S. Envtl. Prot. Agency*, 399 F.3d 486, 491 (2d Cir. 2005).

62. 33 U.S.C. §§ 1311(a), 1342, 1362(12).

63. Robin Kundis Craig, Idaho Sporting Congress v. Thomas *and Sovereign Immunity: Federal Facility Nonpoint Sources, the APA, and the Meaning of "In the Same Manner and to the Same Extent as any Nongovernmental Entity,"* 30 Envtl. L. 527, 533 (2000) ("[N]onpoint sources are, by definition, not point sources"). By contrast, the Clean Water Act defines "point source" to mean "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged." 33 U.S.C. § 1362(14).

64. *Cf.* Final Decision, note 52, *supra*, and accompanying text (Act regulates "discharge of any pollutant by any person" from *point sources* to navigable waters) (emphasis added).

65. Cordiano v. Metacon Gun Club, Inc., 575 F.3d 199, 219 (2d Cir. 2009) (citing 33 U.S.C. § 1251(a)(7) (1987)).

66. 33 U.S.C. §§ 1288(a), 1288(b)(2)(F).

67. Appalachian Power Co. v. Train, 545 F.2d 1351, 1373 (4th Cir. 1976) ("Congress consciously distinguished between point source and nonpoint source discharges, giving EPA authority under the [Clean Water] Act to regulate only the former.").

68. *See* Pronsolino v. Marcus, 91 F.2d 1337, 1352–55 (N.D. Cal. 2000).

of the statute directs a state seeking federal funding to prepare assessment reports "identifying best management practices and measures to control each category and subcategory of nonpoint sources"[69] and to prepare management programs "for controlling pollution added from nonpoint sources to the navigable waters within the State."[70] Between 1990 and 2016, the EPA awarded over $4.2 billion in aid under the program.[71] Nevertheless, as noted above, nonpoint sources remain the leading cause of water impairment nationally.[72]

In pursuing its goal of fishable and swimmable waters,[73] the Clean Water Act has been quite successful at addressing pollution from "point sources" such as pipes.[74] By definition, nonpoint sources are outside that scope and are only loosely regulated by the Clean Water Act.[75]

The Wisconsin Department of Natural Resources (DNR) similarly identifies nonpoint source pollution as "a leading cause of water quality problems in Wisconsin."[76] The state has developed and attempted to implement its Nonpoint Source Program Management Plan.[77] As an example of its activities under that program, the DNR has set "Runoff Management" minimum standards of performance for agricultural and non-agricultural sites.[78] But older Wisconsin farms are often subjected to such standards only when large cost-share percentage grants are available to fund compliance.[79]

Wisconsin's approach to nonpoint source pollution "centers on statewide enforceable agricultural and non-agricultural performance standards and manure management prohibitions."[80] These standards consist of "minimum expectations" applied to a variety of land use practices in both agricultural and

69. 33 U.S.C. § 1329(a)(1)(C).

70. 33 U.S.C. § 1329(b)(1).

71. *See* U.S. Envtl. Prot. Agency, *319 Grant Program for States and Territories*, https://www.epa.gov/nps/319-grant-program-states-and-territories [https://perma.cc/NK7Z-55NY] (last updated Oct. 19, 2017).

72. *See supra* note 59 and accompanying text.

73. *See* 33 U.S.C. § 1251(a)(2) (a goal of the Clean Water Act is to "provide[ ] for the protection and propagation of fish, shellfish, and wildlife and provide[ ] for recreation in and on the water").

74. *Cf.* Kronk, *supra* note 58, at 85.

75. *See* 33 U.S.C. § 1362(12) (expressly excluding "agricultural stormwater discharges and return flows from irrigated agriculture" from the definition of a point source).

76. Wis. DNR, *supra* note 6; *see also supra* notes 45–53 and accompanying text.

77. Wis. DNR, *supra* note 6.

78. WIS. ADMIN. CODE DNR § NR 151 (2017).

79. *See* WIS. STAT. § 281.16(3)(e) (2015–2016); WIS. ADMIN. CODE DNR §§ NR 151.09(4)(d), 151.09(5).

80. Wis. DNR, *supra* note 6, at 9; *see generally* WIS. ADMIN. CODE DNR. § NR 151 (agricultural and non-agricultural performance standards).

developed areas.[81] The DNR sets these standards but depends on the Wisconsin Department of Agriculture, Trade, and Consumer Protection to implement the program in conjunction with county officials.[82] In interviews, DNR staff described this authority as robust.[83] It includes numerous agricultural performance standards, including tillage setbacks,[84] a maximum "phosphorus index,"[85] process wastewater handling restrictions,[86] maximum soil erosion rates,[87] regulations for manure storage facilities,[88] nutrient management planning requirements,[89] and manure management standards and prohibitions.[90] Non-agricultural standards also exist and include sediment discharge regulations applicable to construction sites[91] and standards for developed urban areas.[92]

However, implementation of the standards remains a significant challenge, primarily due to lack of funding but also due to "insufficient staff levels, inadequate time and resources at both the state and county levels, and the lack of cost-share dollars for both hard (e.g. structural) and soft (e.g. management) practices."[93] Effective horizontal coordination between the two responsible state agencies, as well as effective vertical coordination between the agencies and the counties, has also proven difficult.[94]

In the end, nonpoint source pollution remains the leading source of water impairments in Wisconsin. Under the Act, each state is required to prepare a

81. Wis. DNR, *supra* note 6, at 10.

82. *Id.* at 8, 10 ("WDATCP establishes technical standards and other elements related to program implementation").

83. Telephone interview with with Brian Weigel (WDNR), Corrinne Johnson (WDNR), and Andrew Craig (WDNR) (May 8, 2017) (notes on file with author).

84. WIS. ADMIN. CODE DNR § NR 151.03 (intended to "prevent tillage operations from destroying stream banks and depositing soil directly in surface waters").

85. WIS. ADMIN. CODE DNR § NR 151.04. The Phosphorus Index is an "agricultural land management planning tool for assessing the potential of a cropped or grazed field to contribute phosphorus to the surface water."). Wis. Admin. Code § NR 151.015(15s).

86. WIS. ADMIN. CODE DNR § NR 151.055 (prohibiting significant discharges of process wastewater to waters of the state).

87. WIS. ADMIN. CODE DNR § NR 151.02 (maximum soil erosion rate should be less than or equal to the "'tolerable' (T) rate established for that soil.").

88. WIS. ADMIN. CODE DNR § NR 151.05 (establishing construction, alteration, and closure standards for new and existing facilities).

89. WIS. ADMIN. CODE DNR § NR 151.07(3) (manure, fertilizer, and other nutrients must be "applied in conformance with a nutrient management plan").

90. WIS. ADMIN. CODE DNR §§ NR 151.07–151.08 (prohibiting manure overflows, unconfined piles, and direct runoff from stored manure into state waters).

91. WIS. ADMIN. CODE DNR §§ NR 151.105–121.

92. WIS. ADMIN. CODE DNR § NR 151, Subch. III-IV.

93. Wis. DNR, *supra* note 6, at 11.

94. *See id.*

list of waters not meeting current water quality standards.[95] Wisconsin proposed 301 pollutant/water quality segment combinations for its 2014 list.[96] Nonpoint source pollution is by far the leading cause—it is the dominant source of pollution for 43% of these listings and a source to another 15% of the impaired waters listed.[97]

Tensions caused by the intractable nature of the nonpoint source pollution problem boiled over in 2015. Frustrated with the failure of federal and Iowa state law to address nonpoint source pollution, one political subdivision of Iowa sued another.[98] The Des Moines Water Works sued several upstream drainage districts, alleging state tort claims and federal and state statutory and constitutional claims.[99] The Water Works "allege[d] that there has been an increased level of nitrates in [its] water supply caused by the drainage districts channeling of nitrate-contaminated ground water into the water supply."[100] Ultimately, the federal district court dismissed all claims against the drainage district after the Iowa Supreme Court, responding to questions certified by the district court, found that the drainage districts had unqualified immunity against the Water Works' claims for damages and equitable remedies.[101]

Frustrated with the ruling, Des Moines Water Works CEO Bill Stowe issued a news release blaming "unregulated industrial agriculture" for "expensive, serious and escalating water pollution problems" in Central Iowa.[102] Stowe also implored the Iowa Legislature to take action "addressing meaningful, long-term, sustainably funded policy solutions to our serious water problems."[103]

B. Ineffective Controls on Invasive Species

Federal and state laws, regulations, and policies have also proven largely

95. *See* 33 U.S.C. § 1313(d) (2012).

96. Wis. DNR, *supra* note 6, at 24.

97. *Id,* at 24-25. The next leading cause is atmospheric deposition, which was the leading cause for about 19% of impairments. Point sources were the leading cause for almost none of the impairments. *Id.*

98. Bd. of Water Works Trs. of Des Moines v. Sac Cty. Bd. of Supervisors, No. C 15-4020-LTS, 2017 WL 1042072, at *1 (N.D. Iowa Mar. 17, 2017).

99. Bd. of Water Works Trs. of Des Moines, 2017 WL 1042072, at *1.

100. *Id.* at *3.

101. *Id.* at *1, *2.

102. MacKenzie Elmer, *Des Moines Water Works Won't Appeal Lawsuit*, DES MOINES REGISTER (Apr. 11, 2017, 8:19 PM), http://www.desmoinesregister.com/story/news/2017/04/11/des-moines-water-works-not-appeal-lawsuit/100321222/ [https://perma.cc/BGB7-2VGX].

103. Donnelle Eller, *With Water Works' Lawsuit Dismissed, Water Quality is the Legislature's Problem*, DES MOINES REGISTER (Mar. 20, 2017, 11:50 AM) http://www.desmoinesregister.com/story/money/agriculture/2017/03/17/judge-dismisses-water-works-nitrates-lawsuit/99327928/ [https://perma.cc/66C7-BUF2].

inadequate to control the spread of invasive species, as discussed next.

Almost twenty-five years ago, in 1993, the congressional Office of Technology Assessment (OTA) found that "[t]he current Federal framework is a largely uncoordinated patchwork of laws, regulations, policies, and programs. Some focus on narrowly drawn problems. Many others peripherally address [invasive species]. In general, present Federal efforts only partially match the problems at hand."[104]

The core problems identified in the OTA report remain unsolved today despite some small improvements in the federal government's organizational response to invasive species prompted by then-President Clinton's Executive Order 13,112.[105] That Order generally imposed duties on federal agencies to prevent the introduction and establishment of invasive species[106] but only to the extent "practicable" and "subject to the availability of appropriations, and . . . budgetary limits."[107] In 2016, President Obama signed another Executive Order that continued federal efforts to control invasive species and incorporated considerations of climate change.[108]

Many of the invasive species threatening the Great Lakes originated in the ballast water holds of ocean going vessels.[109] This is particularly true of zebra and quagga mussels.[110] In an early response to this problem, and especially the spread of invasive mussels in the Great Lakes, Congress enacted the Non-Indigenous Aquatic Nuisance Prevention Control Act (NANPCA).[111] NANPCA regulates the release of ballast water carried to the United States from areas beyond the United States' exclusive economic zone (EEZ), meaning coastal waters extending beyond 200 miles of the United States coastline.[112]

104. U.S. CONG., OFFICE OF TECH. ASSESSMENT, OTA-F-565, HARMFUL NON-INDIGENOUS SPECIES IN THE UNITED STATES 163 (1993).

105. For example, the Order created the National Invasive Species Council to oversee and implement the federal response to invasive species, among other duties. Exec. Order No. 13,112, 64 Fed. Reg. 6183, 6184–85 (Feb. 3, 1999).

106. *Id.* at 6184.

107. *Id.*

108. Exec. Order No. 13,751, 81 Fed. Reg. 90181 (Dec. 8, 2016)

109. Nat'l RESEARCH COUNCIL, TRANSP. RESEARCH BD., GREAT LAKES SHIPPING, TRADE, AND AQUATIC INVASIVE SPECIES, at ix-x (2008); U.S. ENVTL. PROT. AGENCY, EPA 830-R-15-004, ANALYSIS OF BALLAST WATER DISCHARGES INTO THE GREAT LAKES FROM OVERSEAS VESSELS FROM 2010 TO 2013 1 (2015) (ballast water is a "primary vector" for introduction of aquatic invasive species to the Great Lakes).

110. Nat'l Research Council, *supra* note 109, at ix.

111. 16 U.S.C. §§ 4701–4751 (2012). Congress stated that one purpose of NANPCA is to "prevent unintentional introduction and dispersal of nonindigenous species into waters of the United States through ballast water management and other requirements." Id. § 4701(b)(1); *see also* 16 U.S.C. § 4711(b)(2)(B)(iii); 33 C.F.R. §§ 151.1510(a)(3), 151.2035(b)(3) (2017).

112. *Id.* §§ 4702(5), 4711(b)(2)(A).

NANPCA requires vessels carrying such water to choose one of three compliance options. First, such vessels may completely "exchange" such ballast water before entering the 200-mile EEZ.[113] That exchange eliminates the invasive species from the ballast water either by discharging them into deep sea waters, or by increasing the salinity content of the ballast water to levels that cannot sustain life.[114] Second, such vessels may retain the same ballast water during the entire time they are within the EEZ.[115] Third, the vessels have the theoretical option to comply with other alternative methods approved by the Coast Guard.[116]

At the regulatory level, the EPA has also issued a Vessel General Permit (VGP) that regulates ballast water discharges pursuant to the Clean Water Act.[117] Four environmental groups sued EPA over the VGP, claiming that it acted arbitrarily and capriciously when it selected the standards and requirements in the VGP.[118] The court ultimately agreed and remanded some portions of the permit to EPA for reconsideration.[119]

These limited efforts have occasioned some—but not enough—positive results. In 2015, the EPA prepared a report analyzing ballast water discharges to the Great Lakes and concluded that ballast water flushing requirements are "estimated to be at least 95 percent effective" and have caused a decrease in the rate of new invasive species discoveries in the Great Lakes.[120] But the measures have not been, and likely cannot be, completely effective, and much of the damage has already been done.

The only other federal law particularly notable here is the Great Lakes Fish and Wildlife Restoration Act, which provides authority for the Great Lakes Fishery Commission to "eradicate or minimize" invasive sea lamprey populations in the Great Lakes.[121]

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113. 16 U.S.C. § 4711(b)(2)(B)(i) ; 33 C.F.R. §§ 151.1510(a)(1), 151.2035(b)(1).

114. Cory Hebert, *Ballast Water Management: Federal, States, and International Regulations,* 37 S.U.L. REV. 315, 321 (2010).

115. *See* 33 C.F.R. §§ 151.1510(a)(2), 151.2035(b)(2); *accord* 16 U.S.C. § 4711(b)(2)(B)(ii) (vessels may discharge ballast in "other waters where the exchange does not pose a threat of infestation or spread of aquatic nuisance species in the Great Lakes and other waters of the United States").

116. 16 U.S.C. § 4711(b)(2)(B)(iii) (2012); 33 C.F.R. §§ 151.1510(a)(3), 151.2025 (2017).

117. U.S. ENVTL. PROT. AGENCY, EPA HQ-OW-2011-0141-0949, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) VESSEL GENERAL PERMIT FOR DISCHARGES INCIDENTAL TO NORMAL OPERATION OF A VESSEL (VGP) (2013). The Second Circuit also summarized its provisions as part of the discussion in Nat. Res. Def. Council v. U.S. Envtl. Prot. Agency*,* 808 F.3d 556, 564, 567-68 (2d Cir. 2015).

118. Natural Resources Defense Council v. EPA, 808 F.3d 556, 569–70 (2d Cir. 2015).

119. *Id.* at 571–84.

120. U.S. EPA, *supra* note 109, at 2.

121. 16 U.S.C. § 941c(b)(3) (2012). Historically, this has been done by strategic applications of a "lampreycide" poison that controls, but does not eradicate, lamprey populations in the Great Lakes.

It is unlikely that the deficiencies in federal law will be remedied by state-based solutions, by the common law, or even by executive order. Many of the individual states, including Wisconsin, have enacted some invasive species control programs or measures.[122] However, by their very nature, invasive species are unlikely to remain within a single state. This is especially true of water-based species, but even terrestrial species typically move about the country with little respect for political boundaries.

C. Groundwater Overpumping

The Wisconsin Department of Natural Resources regulates groundwater withdrawals—and specifically high capacity wells— under Chapter 281 of the Wisconsin Statutes.[123] The agency also has general authority as the state's designated "trustee" under the public trust doctrine.[124] As described next, neither source of power is sufficient to address the overpumping described in Section I.C. of this Article.

As an initial matter, one seeking to install a high capacity well must obtain approval from the Department before constructing the well.[125] In certain special cases, the Department must conduct an environmental review of the well's potential impacts.[126] But most wells do not fall into those categories; and in such cases, the statute is silent regarding the scope of the Department's authority to review the application or to impose conditions on the operation of the well.

In those cases, the Department had historically relied on its general authority under the public trust doctrine[127] to impose conditions as needed.[128] As the name suggests, that doctrine is generally taken to mean that a state must act as "trustee" of certain natural resources, particularly the navigable waters of the state, and manage them for the trust beneficiaries—its people.[129] It is

See Egan, *supra* note 18, at 50–65 (describing the initial lamprey invasion, population boom, and eventual control and management).

122. *See, e.g.*, WI Dep't of Natural Resources, *Control Methods*, http://dnr.wi.gov/topic/invasives/control.html [https://perma.cc/E999-LJMH] (last updated Nov. 8, 2016).

123. *See* Wis. Stat. § 281.34(2).

124. *See* AKBA Ltd. P'ship v. DNR, 2002 WI 106, ¶ 12, 648 N.W.2d 854; Borsellino v. DNR, 2000 WI App 27, ¶ 19, 606 N.W.2d 255.

125. Wis. Stat. § 281.34(2) (2015–16).

126. Wis. Stat. § 281.34(4) (extended review required with respect to wells in groundwater protection zones, wells for which more than 95% of the water withdrawn would be lost from the basin, and wells that could have a significant impact on a spring).

127. ABKA Ltd. P'ship v. Wis. DNR, 648 N.W.2d 854 ¶ 12 (Wis. 2002).

128. *See* Lake Beulah Mgmt. District v. DNR, 2011 WI 54, ¶¶ 3–4, 335 Wis. 2d 47, 799 N.W.2d 73.

129. The public trust doctrine can be traced back to ancient Roman law and the Institutes of Justinian. Juliana v. United States, 217 F. Supp. 3d 1224, 1253 (2016) (doctrine's "roots are in the

rooted in the state constitution,[130] which itself borrowed heavily from the Northwest Ordinance of 1787.[131]

In 2011, the Wisconsin Supreme Court expansively interpreted the public trust doctrine as a valid basis for DNR to consider whether to grant, conditionally grant, or deny a high capacity well permit based on the well's impact on other waters of the state.[132] In a remarkable turn of events, however, that decision may no longer be good law.

In 2011, the Wisconsin Legislature enacted Wis. Stat. § 227.10(2m), which requires explicit statutory or regulatory authority for actions taken by administrative agencies, including the imposition of permit conditions. In late 2015, a Wisconsin trial court relied on § 227.10(2m) to prevent DNR from imposing certain conditions in a high-capacity well permit.[133] And in a 2016 opinion, Attorney General Brad Schimel concluded that "[t]hrough these changes to the law, [DNR's] public trust duty . . . reverts back to the Legislature, which is responsible for making rules and statutes necessary to protect the waters of the state."[134] This interpretation could prevent DNR from imposing high capacity well permit conditions—or conceivably, from taking any action whatsoever based solely on the constitutionality—and common law-rooted public trust doctrine.

All of this likely means that in cases where the statute is silent—as in all high capacity well applications other than the special exceptions noted above—the Department has no authority to impose conditions on the operation of high capacity wells.[135]

Institutes of Justinian, part of the Corpus Juris Civilis, the body of Roman law that is the 'foundation for modern civil law systems.'"). In this country, the United States Supreme Court recognized it in the seminal 1892 decision *Illinois Central Railroad Co. v. Illinois*, 146 U.S. 387 (1892).

130. Wis. Const. art. IX, § 1 ("the river Mississippi and the navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways and forever free").

131. Ordinance of 1787: The Northwest Territorial Government, art. IV ("The navigable waters leading into the Mississippi and St. Lawrence, and the carrying places between the same, shall be common highways, and forever free").

132. Lake Beulah Mgmt. Dist. v. Wis. DNR, 799 N.W.2d 73 ¶¶ 3–5 (Wis. 2011).

133. Decision and Order, New Chester Dairy v. DNR, Case No. 2014CV1055 (Outagamie County Cir. Ct. (Dec. 2, 2015).

134. State of Wis. Dep't of Justice, OAG-01-16, Opinion Letter on the Application of Wis. Stat. § 227.10(2m) to the Issuance of High Capacity Groundwater Well Withdrawal Permits ¶ 53 (May 10, 2016).

135. *See also* 2017 Wisconsin Act 10 (signed June 1, 2017) (no additional Department approval is necessary for an existing high capacity well owner to repair, maintain, or reconstruct the well within a 75-foot radius of the existing well or to transfer it to a new owner as part of a land sale).

III. INNOVATIVE SOLUTIONS

The final section of this Article begins to map out the theoretical underpinnings for alternative approaches to water quality using Professor Henry Smith's theory of the "semicommons." It also identifies possible innovative approaches to nonpoint source management, one of the problems discussed above. Similar development with respect to invasive species management and groundwater overpumping is left for future work.

A. Extending Smith's Theory of the Semicommons from Water Use Rights (Quantity) to Water Quality

Professor Henry Smith has proposed that water and other "fluid resources," such as intellectual property, "call for hybrid property systems combining private and common elements."[136] Smith calls this combination a "semicommons" and admits that it "require[s] much more fine-tuning through rules . . . than do more-familiar kinds of resources."[137]

"[S]eparation between groups of uses is difficult," Smith notes, when it comes to fluid resources.[138] This leads to an important dilemma, because fluid resources are valuable for a variety of uses by a variety of users.[139] This can lead to conflict when (as Smith notes) the uses are on different scales;[140] or (we might add) when the uses are incompatible because one degrades the water's purity to the point that it is unfit for the other's use. To put this in Smith's terms, "sometimes strategic behavior will allow shifting more than a proportionate cost to others and grabbing disproportionate benefits."[141]

Smith analyzes two theoretical poles of property law to fluid resources: exclusion and governance.[142] The solution, Smith writes, is to conceptualize fluid resources "to a regime of semicommons, in which different interacting uses are subject to different property regimes, some private and some common."[143] In the end, these public and private rights "interlock so tightly that it makes sense to see them as different versions of semicommons."[144]

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136. Henry E. Smith, *Semicommons in Fluid Resources*, 20 MARQ. INTELL. PROP. L. REV. 195, 196 (2016).

137. *Id.*

138. *Id.* at 197.

139. *Id.* at 197–98.

140. *Id.*

141. *Id.* at 198.

142. *Id.*

143. *Id.*; *see also* Henry E. Smith, *Governing Water: The Semicommons of Fluid Property Rights*, 50 ARIZ. L. REV. 445, 449 (2008) ("A semicommons exists where private and common property overlap and potentially interact.").

144. Smith, *supra* note 136, at 208.

While Smith's work refers generally to the implications of the semicommons for "water law,"[145] his analysis is primarily devoted to the allocation of private water rights—in other words, to water *quantity*. Yet in so many situations, that quantity is tightly related to water *quality*.[146] It has long been recognized that "[a]ny separation between water quantity and water quality is artificial and stands in the way of solutions."[147] In Smith's terminology, "the claim is that as the interactivity and importance of third-party effects become more important we will not only get more delineation effort but that it will take the form of more governance."[148] Of course, the same is true of water quality impacts caused by third parties. Smith also recognizes that certain public uses and public trust rights, such as navigation, may override private rights to use water.[149]

Given the close relationship between water quantity and water quality, it is worth investigating whether the "semicommons" should extend in some form to concerns over both elements. Recognized rights to use the resource on the one hand should lead to corresponding responsibilities on the other. Even prior to the advent of modern laws that protect water quality, courts had long held that where one riparian's use of the water renders it unfit for use by another, the former is liable to the latter.[150]

B. Beyond Regulation: Other Innovative Proposals to Leverage the Semicommons

If one accepts the conclusions in this article that, first, Wisconsin waters

145. Smith, *supra* note 143, at 450 ("The Nature of Water Law"); *id*. at 466 ("Water law tends to be viewed as either private property on the one hand or as a pure tort-like commons or a regulatory regime on the other."). The reference to "water law" seems an oversimplification given that Smith refers here to private water rights rather than pollution control or other water quality concerns also germane to "water law."

146. PUD No. 1 of Jefferson County v. Wash. Dep't of Ecology, 511 U.S. 700, 719 (1994) (finding that reduction of the volume of a water body could destroy its quality and even constitute "water pollution" under the Clean Water Act). *Id.*

147. Anne W. Squier, *Water Quality Under Western Water Law*, 21 ENVTL. L. 1081, 1083 (1991); *see also* Reed Benson, *Pollution Without Solution: Flow Impairment Problems Under Clean Water Act Section 303*, 24 STAN. ENVTL. L.J. 199, 204 (2005) ("water quantity can significantly affect water quality"); Holly Doremus & A. Dan Tarlock, *Can the Clean Water Act Succeed as an Ecosystem Protection Law?*, 4 GEO. WASH. J. ENERGY & ENVTL. L. 46, 62 (2013) (water quality and water quantity are "intimately and unavoidably linked").

148. Smith, *supra* note 136, at 456.

149. *Id*. at 470 (citing "public trust uses"). In Wisconsin and many other states, the public trust doctrine also protects uses tightly related to water quality, such as fishing, recreation, and scenic beauty. *Rock-Koshkonong Lake Dist. v. Wis. DNR*, 833 N.W.2d 800 ¶¶ 87–88 (Wis. 2013).

150. *See, e.g.*, H.B. Bowling Coal Co. v. Ruffner, 100 S.W. 116, 117–18, 122 (Tenn. 1907) (holding that "[a]ny use of . . . the water of a stream itself, which renders the water unwholesome, offensive, or unfit for the purposes for which it is used, is unlawful.").

face a variety of serious threats; that, second, existing laws and regulations are not sufficient to control these threats;[151] and that, third, the theory of the semicommons implies both public and private rights and responsibilities with respect to water quality, then the question becomes: What is to be done? New or strengthened environmental regulations seem improbable in the current political climate.[152]

One potential path for Wisconsin, in the face of retreating federal and state involvement, is a greater role for local or private efforts to improve water quality. Indeed, private water users should feel a moral obligation to maintain or even improve water quality in light of their rights to use water under Wisconsin's system of "reasonable use."[153]

Increased private engagement in water quality efforts face substantial hurdles. At a minimum, private entities must be convinced of the "business case" to become involved. This first assumes that historical antipathy of private firms and individuals toward environmental protection[154] can be overcome. This issue is complex. Theoretically, several considerations might convince private firms and individuals to embrace voluntary participation in environmental protection. Properly designed and executed voluntary initiatives can "cut costs, increase market share and create new market opportunities."[155] For example, in the context of sustainable agriculture leading to improved water quality, the benefits could include improved profitability due to efficient fertilizer management; increased confidence in grower decision-making as a result of advanced data collection and management efforts; marketing advantages given the sustainability demands increasingly imposed by retailers upon suppliers; and even improved reputation among supply chain partners and with consumers.[156] Some optimistic estimates suggest that industry actually prefers to self-adopt voluntary environmental conservation initiatives to forestall environmental problems that would trigger the onset of mandatory

151. *Accord* ROBERT KERR ET AL., BEYOND REGULATION: EXPORTERS AND VOLUNTARY ENVIRONMENTAL MEASURES, at ix (1998) (citing a "growing realization . . . that traditional regulatory tools alone are not adequate").

152. *But see* David A. Strifling, *The Microbead-Free Waters Act of 2015: Model for Future Environmental Legislation, or Black Swan?*, 32 J. LAND USE & ENVTL. L. 151, 159–61 (2015) (suggesting strategies for advocates of future environmental legislation).

153. Hocking v. Dodgeville, 768 N.W.2d 552 ¶¶ 14, 18 (describing "reasonable use" doctrine).

154. *Accord* Laura A. Cisneros, *Environmental Resistance: Defying Capitalism's Structure of False Rebellion*, 8 GOLDEN GATE U. ENVTL. L.J. 5, 7 (2015) (arguing that "environmental protection and capitalism are inherently oppositional" and generate "antipathies so fundamental that they make current environmental protection laws inadequate").

155. Kerr, *supra* note 151, at xi.

156. *See* Suzy Friedman, *Beyond Regulation: Making the Business Case For Sustainable Farming* (Jan. 7, 2015), http://blogs.edf.org/growingreturns/2015/01/07/beyond-regulation-making-the-business-case-for-sustainable-farming/ [https://perma.cc/LRZ9-V7GB].

regulations.[157]

However, other recent studies have shown that the voluntary adoption rate of nutrient reduction technologies to improve water quality is relatively low, even when substantial incentives are provided to do so.[158] Sampled farmers had an unrealistically high perception of existing water quality and, unsurprisingly, strongly opposed penalties for noncompliance with environmental regulations.[159]

Safeguards would be necessary to mitigate the risk of private involvement with public trust resources. For example, strong objections have been raised to direct ownership of public water utilities by for-profit entities.[160] Environmental groups often strongly oppose even voluntary initiatives for environmental protection, preferring the security of mandatory regulations and enforcement efforts.[161] Depending on the structure, public-private partnerships are hailed in some quarters[162] and disparaged in others.[163] In any such arrangement, the level of built-in safeguards to protect public safety is highly variable from state to state.[164]

Assuming those hurdles are cleared, innovative public-private partnership efforts to control nonpoint source pollution could shape up in the following ways.

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157. *Id.*

158. Florence G. Gachango et al., *Adoption of Voluntary Water-Pollution Reduction Technologies and Water Quality Perception Among Danish Farmers*, 158 AGRIC. WATER MGMT. 235, 235 (2015).

159. *Id.*

160. *See, e.g.*, Food & Water Watch, *Water Privatization: Facts and Figures* (Aug. 31, 2015), https://www.foodandwaterwatch.org/insight/water-privatization-facts-and-figures [https://perma.cc/BT7Y-4CTR] ("privatizing local water and sewer systems usually does farm more harm than good for our communities").

161. James Q. Lynch, *Water Quality Advocates Say Voluntary Actions Not Working,* THE GAZETTE (Nov. 17, 2016 2:01 PM), http://www.thegazette.com/subject/news/business/agriculture/water-quality-advocates-say-voluntary-actions-not-working-20161117 [https://perma.cc/2XKA-CTP7] (environmental advocates call for "farmland regulation" instead of voluntary pollutant reduction strategies); *see also* Kerr, *supra* note 151, at xi.

162. Michael Della Rocca, *The Rising Advantage of Public-Private Partnerships*, MCKINSEY & CO. (July 2017) https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/the-rising-advantage-of-public-private-partnerships [https://perma.cc/W4CF-CTLH].

163. *See, e.g.,* Food and Water Watch, *supra* note 136; David Hall, *Why Public-Private Partnerships Don't Work*, PUBLIC SERVICES INTERNATIONAL RESEARCH UNIT (Feb. 2015) http://www.world-psi.org/sites/default/files/rapport_eng_56pages_a4_lr.pdf [https://perma.cc/FE8Q-F622].

164. *See* Craig Anthony (Tony) Arnold, *Water Privatization Trends in the United States: Human Rights, National Security, and Public Stewardship*, 33 WM.& MARY ENVTL. L. POL'Y REV. 785, 792–93 (2009).

1. "Sponge Cities"

In an era of decreasing federal and state involvement,[165] local environmental conservation efforts take on increased importance. In the context of nonpoint source pollution, this can take the form of "green infrastructure"[166] and other devices to improve water quality.

This movement can take new inspiration from a (perhaps) unlikely source: China.[167] In 2013, Chinese President Xi Jinping announced a plan to transform Chinese cities into "sponges."[168] These "sponge cities" are designed to retain stormwater in a variety of ways, purifying it as it moves through "green infrastructure" and soil, and ultimately storing it as groundwater for re-use.[169] This process allows the city to regenerate and expand its own water supply while simultaneously reducing the burden on traditional infrastructure, such as wastewater treatment facilities. In 2015, the Chinese government released detailed guidance "on [a]dvancing the [c]onstruction of [s]ponge [c]ities" directing that 70% of urban rainfall will be captured and re-used.[170] China now

165. *See, e.g.*, Evan Lehmann & Emily Holden, *Trump Budget Cuts Funds for EPA by 31 Percent*, SCIENTIFIC AMERICAN (Mar. 16, 2017) https://www.scientificamerican.com/article/trump-budget-cuts-funds-for-epa-by-31-percent/ [https://perma.cc/56VW-J4RQ]; Associated Press, *Wisconsin DNR Sees Job Cuts, Slashed Budget* (Jan. 15, 2017 11:53 AM) http://minnesota.cbslocal.com/2017/01/15/wisconsin-dnr-job-cuts/ [https://perma.cc/3XSH-CK3F]; Siri Carpenter, *How Scott Walker Dismantled Wisconsin's Environmental Legacy*, SCIENTIFIC AMERICAN (June 17, 2015) https://www.scientificamerican.com/article/how-scott-walker-dismantled-wisconsin-s-environmental-legacy/ [https://perma.cc/VM5L-KAF5].

166. Green Infrastructure refers to a variety of "mechanisms that mimic, maintain, or restore natural hydrological features in the urban landscape." Caswell F. Holloway et al., *Solving the CSO Conundrum: Green Infrastructure and the Unfulfilled Promise of Federal-Municipal Cooperation*, 38 HARV. ENVTL. L. REV. 335, 335 (2014). *See generally* U.S. Environmental Protection Agency, *Green Infrastructure*, EPA.GOV (Oct. 20, 2017) https://www.epa.gov/green-infrastructure [https://perma.cc/N4C9-WVQK].

167. *See* Robert V. Percival, *China's "Green Leap Forward" Toward Global Environmental Leadership*, 12 VT. J. ENVTL. L. 633, 633–34 (2011) (noting that China's historical policies have been described as a "War Against Nature" but that "there are signs of a dramatic improvement in environmental consciousness in China in recent years").

168. James Workman, *Sponge Cities: Can China's Model Go Global?*, THE SOURCE (July 13, 2017), https://www.thesourcemagazine.org/sponge-cities-can-chinas-model-go-global/ [https://perma.cc/6NNQ-KB2S].

169. Tools for "sponge cities" include bioswales, green roofs, retention ponds, and porous pavements, among other things. Working together, these measures, when combined with others, can reduce runoff from sponge cities by eighty-five percent. *Id.*

170. General Office of the State Council, *Guiding Opinions of the General Office of the State Council on Advancing the Construction of Sponge Cities*, effective November 10, 2015. Translated versions of the guidance are not freely available, but rough Internet translations show a well-formed policy that both defines sponge city management, establishes the 70% requirement, and sets out basic scientific principles to guide sponge city development. *See* https://translate.google.com/translate?hl=en&sl=zh-TW&u=http://en.pkulaw.cn/display.aspx%3Fcgid%3D258397%26lib%3Dlaw%26EncodingName%

boasts more than thirty such "sponge cities."[171]

2. Voluntary Programs and Initiatives

Voluntary programs to address environmental problems are nothing new. In fact, "[e]nvironmental externalities emanating from agricultural production have traditionally been dealt with in the United States through voluntary approaches."[172] No doubt, however, there is room for improvement; as noted above, these measures "have largely failed to improve water quality" in impaired waters.[173] Recent studies have shown that performance-based approaches (measuring the ultimate performance of the measure) are more efficient than approaches that specify adoption of a particular technology.[174] However, performance-based policies "are difficult to implement for nonpoint source pollution because pollutant discharge cannot easily be measured and regulators lack the information necessary to set optimal performance goals."[175] Program leaders therefore often focus instead on inputs and management practices, known as design-based approaches.[176]

Some Midwestern states already have voluntary programs for nonpoint source control. Minnesota's "Agricultural Water Quality Certification Program" allows farmers to voluntarily implement certain conservation practices in exchange for "regulatory certainty" for a period of ten years, along with marketing status advantages and priority for technical and financial assistance.[177] Farmers who decide to take part in the program must verify compliance with existing federal and state water quality laws and rules, including the Clean Water Act.[178] Field verification by program staff then "establishes that the practices and commitments of certified producers are accurate and that there are no additional resource concerns to be addressed."[179] In Iowa, the state's "Nutrient Reduction Strategy" aims to reduce by 45%

3Dbig5&prev=search [https://perma.cc/3D77-2MNA].

171. Workman, *supra* note 168.

172. Jeff Savage & Marc Ribaudo, *Improving the Efficiency of Voluntary Water Quality Conservation Programs*, 92 LAND ECON. 148, 148 (2016). This is in stark contrast to externalities derived from industrial "end-of-pipe" sources, dealt with by regulations issued under the authority of the Clean Water Act. *Id.*

173. *Id.*

174. *See generally id.*

175. *Id.* at 155.

176. *Id.*

177. Minn. Stat. § 17.9891–17.9993 (2017).

178. MINN. DEP'T OF AGRIC., MINNESOTA AGRICULTURAL WATER QUALITY CERTIFICATION PROGRAM 6 (Jan. 30, 2015).

179. *Id.* at 7.

the load of phosphorus and nitrogen to the Gulf of Mexico.[180] The Strategy calls for "[a] concerted, cooperative and sustained effort by both point and nonpoint sources" to meet this goal.[181] Specifically, the Strategy involves watershed prioritization and will employ a combination of on- and off-field practices and pilot projects.[182] As part of the strategy, Iowa launched the Farmer Recognition Program to increase public recognition of participating farmers, along with a statewide education and marketing campaign.[183] The Strategy is somewhat light on details of progress-measuring metrics, stating only that Iowa will "develop new and expanded frameworks to track progress, beyond the traditional ambient water quality monitoring networks."[184]

Advocates describe these voluntary measures as flexible and effective, especially as compared to the "blunt instrument[s]" embodied in mandatory regulations that are "lock[ed] . . . in time" and "stifle . . . creativity."[185] Moreover, they can often be implemented quickly as compared to traditional regulations, which often take years to draft and implement and are often bogged down by lengthy legal challenges.

Other proposals for more indirect private involvement could include increased support for grant programs or public educational campaigns.

CONCLUSION

As it moves forward in the twenty-first century, Wisconsin faces many threats to a resource at the core of its identity—its abundant fresh water. One thing is clear, traditional "command and control" regulatory approaches, standing alone, are not likely to suffice. Instead, overcoming these challenges will require innovative approaches that are just beginning to emerge.

180. IOWA DEP'T OF AGRIC. AND LAND STEWARDSHIP ET AL., IOWA NUTRIENT REDUCTION STRATEGY: A SCIENCE AND TECHNOLOGY-BASED FRAMEWORK TO ASSESS AND REDUCE NUTRIENTS TO IOWA WATERS AND THE GULF OF MEXICO 1 (Sept. 2016).

181. *Id.* at 2.

182. *Id.* at 21.

183. *Id.* at 22.

184. *Id.* at 24.

185. Dirck Steimel, *Northey: Voluntary Water Quality Effort Far Superior to Regulation* (Feb. 2, 2015) IOWA FARM BUREAU https://www.iowafarmbureau.com/Article/Northey-Voluntary-water-quality-effort-far-superior-to-regulation [https://perma.cc/BDW2-WZEH] (quoting Iowa Agriculture Secretary Bill Northey).