

HOW TO CLEAN A SEWER: Local and Federal Teamwork Can Reduce Phoenix’s Storm Water Pollution

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The real wealth of the Nation lies in the resources of the earth—soil, water, forests, minerals, and wildlife. To utilize them for present needs while insuring their preservation for future generations requires a delicately balanced and continuing program, based on the most extensive research. Their administration is not properly, and cannot be, a matter of politics.

— Rachel Carson¹

I. INTRODUCTION

The environmental regime founded in the 1970s and led by the U.S. Environmental Protection Agency (“EPA”) dramatically restored water quality by sharply reducing highly visible industrial “point source”² pollution discharges.³ But a majority of U.S. waterways the EPA surveyed in 2010 remained too polluted for outdoor activities, and the EPA currently identifies more waterways as “impaired” by pollution than as “good.”⁴ Much of that is

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1. RACHEL CARSON, *Mr. Day’s Dismissal*, in LOST WOODS 98, 99 (Linda Lear ed., Beacon Press 1998).

2. Clean Water Act § 502(14), 33 U.S.C. § 1362(14) (2018) (“‘[P]oint source’ means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, [or] container . . . from which pollutants are or may be discharged.”).

3. William L. Andreen, *Success and Backlash: The Remarkable (Continuing) Story of the Clean Water Act*, 4 GEO. WASH. J. ENERGY & ENVTL. L. 25, 26 (2013). Andreen cites EPA analysis of dissolved oxygen in waterways before and after the Clean Water Act to conclude that it provided “unambiguous evidence that the Act’s approach to point source regulation was environmentally effective.” *Id.* at 29.

4. *Id.* at 30; *National Summary of State Information*, U.S. ENVTL. PROT. AGENCY, https://ofmpub.epa.gov/waters10/attains_nation_cy.control (last visited Jan. 2, 2019); *see also* Shaowei Sun, Zhiqiang Deng & Daniel Dianchen Gang, *Nonpoint Source Pollution*, 82 WATER ENV’T RESEARCH 1875, 1875 (2010) (“Urban stormwater contains a broad spectrum of

due to storm water—natural precipitation, which is not a heavily regulated point source under the Clean Water Act (“CWA”)—absorbing pollutants as it flows over land and depositing them into waterways.⁵ Animal waste and pesticides pollute water as it trickles over farm fields.⁶ In cities, storm water carries pollutants such as oil, chemicals, metals, and pet waste⁷ into municipal storm sewers, which empty into natural waterways.⁸ This runoff is called nonpoint source pollution because it has no clearly definable source. Rather, it comes from an accumulation of everyday activities from a wide variety of non-traceable sources. It is the primary polluter of streams, rivers, and lakes⁹ and taints cities’ drinking water sources.¹⁰

The EPA is cutting back both in terms of financing¹¹ and regulation,¹² so new federal pollution control is unlikely. The *FY 2019 EPA Budget in Brief* follows suit with the 2018 EPA budget plan’s call to eliminate a grant to states for nonpoint source pollution mitigation entirely, a program that cost \$164 million in the 2017 budget.¹³ The 2018 and 2019 budget proposals state that the federal government intends to delegate more environmental protection to

contaminants ranging from suspended solids to nutrients, heavy metals, and pathogenic bacteria.”).

5. Andreen, *supra* note 3, at 27.

6. Lara D. Guercio, *The Struggle Between Man and Nature—Agriculture, Nonpoint Source Pollution, and Clean Water: How to Implement the State of Vermont’s Phosphorous TMDL Within the Lake Champlain Basin*, 12 VT. J. ENVTL. L. 455, 525 (2011).

7. *Id.* at 462.

8. Stacy D. Harrop, *Municipal Separate Storm Sewer Systems: Is Compliance with State Water Quality Standards Only a Pipe Dream?*, 31 ENVTL. L. 767, 769 (2001).

9. Andreen, *supra* note 3, at 31.

10. *Basic Information About Nonpoint Source (NPS) Pollution*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution> (last visited Oct. 28, 2018).

11. U.S. ENVTL. PROT. AGENCY, *FY 2018 EPA BUDGET IN BRIEF 9* (2017), <https://www.epa.gov/sites/production/files/2017-05/documents/fy-2018-budget-in-brief.pdf> [hereinafter EPA 2018] (listing proposed reduction of total EPA spending from \$8.2 billion in fiscal 2017 to \$5.7 billion in fiscal 2018); *see also* U.S. ENVTL. PROT. AGENCY, *FY 2019 EPA BUDGET IN BRIEF 11* (2018), <https://www.epa.gov/sites/production/files/2018-02/documents/fy-2019-epa-bib.pdf> [hereinafter EPA 2019] (listing expenditures of \$8 billion in 2018 and proposal to reduce spending to \$6.1 billion in 2019, or \$4.2 billion less than the Agency spent in 2010).

12. *See* Steven Mufson, *Trump Wants to Scrap Two Regulations for Each New One Adopted*, WASH. POST (Jan. 30, 2017), https://www.washingtonpost.com/news/energy-environment/wp/2017/01/30/trump-wants-to-cut-two-regulations-on-businesses-for-every-new-one-imposed/?utm_term=.2c8e5eb17bba (detailing potential difficulties the president’s executive order on regulations poses).

13. EPA 2019, *supra* note 11, at 59; EPA 2018, *supra* note 11, at 39 (indicating that nonpoint source grants were funded at fiscal 2017 levels in fiscal 2018 despite their proposed elimination in fiscal 2018, with further plans to eliminate nonpoint source grants in 2019).

local, state, and tribal governments.¹⁴ However, federal agencies, their appointed leaders, and the longstanding regulations they impose on states are less vulnerable to voter backlash and more likely to persist in the long term than pollution plans from the states' elected governments.¹⁵ State voters eager for progress on education and the economy might punish elected officials who pursue long-term spending on cleanup of polluted storm water that might be beneficial but not dramatic and visible to everyone.¹⁶ Moreover, the pressure on states to attract business can reduce incentives to enact regulations that burden polluting industries, such as construction.¹⁷

Still, Arizona presently meets or exceeds federal standards under the CWA¹⁸ and has taken over the point source permitting program.¹⁹ The states are motivated to keep standards high because of pressure to avoid EPA objections and takeovers, so, if the EPA loosens its standards, the state might also allow more pollution.²⁰ Loosened restrictions also would likely mean continued failures to mitigate nonpoint source pollution, such as Phoenix storm runoff, which is relatively lightly regulated.²¹

14. See EPA 2018, *supra* note 11, at 2 (“Responsibility for funding local environmental efforts and programs is returned to state and local entities, while federal funding supports priority national work.”). The 2019 budget plan emphasizes a need to “[r]ebalance the power between Washington and the states.” EPA 2019, *supra* note 11, at 1.

15. See Christel Koop & Chris Hanretty, *Political Independence, Accountability, and the Quality of Regulatory Decision-Making*, 51 COMP. POL. STUD. 38, 39 (2017) (examining relief from electoral pressure of world’s independent regulatory agencies led by appointed officials); Peter J. May, *Regulatory Regimes and Accountability*, 1 REG. & GOVERNANCE 8, 9 (2007) (discussing shortfalls in accountability in regulatory regimes).

16. See EXPECT MORE ARIZ., ARIZONA PUBLIC OPINION SURVEY 1 (2017), <http://expectmoreaz-wpengine.netdna-ssl.com/wp-content/uploads/2018/01/EMA-Dec-2017-Poll-Summary-FINAL.pdf> (listing education, government spending, and the economy among voters’ top priorities in a poll conducted by an educational interest group).

17. The case of Delaware’s victory in corporate attraction in the race to the bottom, or race to the top, involves creating favorable conditions for business, potentially at the expense of regulatory goals that could burden corporations. *But see* Daniel J.H. Greenwood, *Democracy and Delaware: The Mysterious Race to the Bottom/Top*, 23 YALE L. & POL’Y REV. 381, 383 (2005) (arguing that business managers take legal and moral stands rather than treating such matters as obstacles to profit).

18. Clean Water Act § 402, 33 U.S.C. § 1342 (2018).

19. See State Program Requirements; Approval of Application by Arizona to Administer the National Pollutant Discharge Elimination System (NPDES) Program; Arizona, 67 Fed. Reg. 79,629, 79,629–30 (Dec. 30, 2002), <https://www.gpo.gov/fdsys/pkg/FR-2002-12-30/pdf/02-32907.pdf> [hereinafter Arizona NPDES Approval].

20. See *id.* at 79,630.

21. See Alan Curtis, *Who Picks Up the Check? Nonpoint Source Pollution and the Clean Water Act*, 13 U. DENV. WATER L. REV. 55, 59 (2009) (“Congress did not include nonpoint sources in the CWA because of the high quantity, the difficulty in regulating them, [and] the controls are often not cost-effective . . .”).

This Comment argues that the federal government is best positioned to mandate reducing nonpoint source pollution, and it should not further delegate this responsibility to the states. Governors, as well as state and federal lawmakers, face regular elections in the short term that constrain their ability to regulate the environment in the long term. Voters do not target longstanding, entrenched federal regulations, but they might lash out against new local regulations.²² Federal aid can give states and local entities support to advance storm water cleanup efforts such as green infrastructure. Cleaner storm runoff would improve Arizona water appropriators' supplies or provide a clean, new resource to recharge critical aquifers.

However, without a strong, forward-looking federal lead involving clear regulations and science-based standards, environmental law has historically taken reactive approaches that tolerate environmental degradation for economic gain. A local and state approach without strong federal input would likely follow suit with history, allowing the polluting to continue. Therefore, the federal government should set benchmarks for reducing specified nonpoint source water pollutants and empower the states to determine how to meet those goals. This approach would reduce the risk of illnesses and the need for costly purification of unhealthy water. It would force the states to preserve a vital resource despite economic pressure to reduce pollution control. Pinpointing the worst pollutants would be a more economical approach than more comprehensive pollution control. Plus, the flexible approach would enable locally sensible remedies better than uniform federal rules, which might not account for regional differences.

Part II, Section A summarizes the water regulatory regime the EPA and Arizona impose, subject to incoming limitations on regulatory controls and funding. Section B traces the history of environmental law's effects to identify potential alternatives in line with the EPA's new emphasis on local action. Section C examines the present state of water quality control.

Part III argues that nuisance and state-centered approaches will keep pollution flowing into water. It argues that the leadership and support of a strong EPA remains a crucial baseline for water protection. Local efforts to reach federal benchmarks would enable particularized solutions in Arizona and beyond for environmental and economic benefit. Part IV concludes.

22. See Michael A. Livermore, *Reviving Environmental Protection: Preference-Directed Regulation and Regulatory Ossification*, 25 VA. ENVTL. L.J. 311, 314 (2007) (“[R]egulatory ossification [or stagnation] is the result of stable political equilibriums that form around regulatory regimes. These equilibriums form because building the political coalitions necessary to revise a regime becomes increasingly difficult the longer the regime has been in place.”).

II. BACKGROUND

A. *The Current Federal and Arizona Schemes for Storm Water Regulation*

The Federal Water Pollution Control Act, which after amendments in 1972 and 1977 became known as the Clean Water Act, mandates water quality control nationwide.²³ One provision requires oversight and permits for discharges of pollutants from a point source into navigable surface waters²⁴ defined as “waters of the United States.”²⁵ The definition of jurisdictional surface waters has remained murky despite Supreme Court decisions and EPA guidance.²⁶ However, the CWA currently applies to “relatively permanent . . . flowing bodies of water,” such as Phoenix’s Salt River.²⁷ To aid in its enforcement, the CWA allows citizen suits for injunctions and money damages.²⁸

As for state pollution control, Arizona has proven that its point source program meets or exceeds federal point source pollution control requirements and it took control of that task from the EPA in 2002.²⁹ Point source discharges require National Pollutant Discharge Elimination System (“NPDES”) permits or state equivalents³⁰ to ensure monitoring and reduction of harmful discharges into surface waters.³¹ Surface waters in Arizona are above-ground features such as streams and lakes, as well as flowing water in

23. 33 U.S.C. §§ 1251–1387.

24. *Id.* § 1342.

25. *Id.* § 1362(7).

26. Heather Keith, *United States v. Rapanos: Is “Waters of the United States” Necessary for Clean Water Act Jurisdiction?*, 3 SETON HALL CIR. REV. 565, 567–68 (2007) (discussing conflicting congressional stances and U.S. Supreme Court’s lack of clarity on Clean Water Act jurisdiction); *see also* *Rapanos v. United States*, 547 U.S. 715, 718 (2006) (non-majority judgment failing to establish single test for determining wetlands jurisdiction).

27. *See Rapanos*, 547 U.S. at 732.

28. 33 U.S.C. § 1365; *see also* Patrick S. Cawley, *The Diminished Need for Citizen Suits to Enforce the Clean Water Act*, 25 J. LEGIS. 181, 184 (1999) (“[C]ourts emphasize the congressional intent that citizen suits merely supplement unsuccessful enforcement by the government . . .”).

29. *See Arizona NPDES Approval*, *supra* note 19, at 769,630–31.

30. *NPDES Permits Around the Nation*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes-permits> (last visited Oct. 25, 2018) (explaining that forty-six states, including Arizona, issue their own permits).

31. *NPDES Permit Basics*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/npdes-permit-basics> (last visited Oct. 26, 2018); *see also* *Definition of “Waters of the United States” Under the Clean Water Act*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/cwa-404/definition-waters-united-states-under-clean-water-act> (last visited Oct. 26, 2018).

defined underground waterways, but not underground aquifers.³² States must demonstrate to federal authorities that they will adhere to federal standards before they may take over point source permitting.³³

However, the federal and state governments do not apply similar scrutiny to nonpoint source pollution and storm sewers.³⁴ The CWA provides a grant program to help states' efforts to fight nonpoint pollution, but the 2019 EPA budget plan would eliminate funding for that grant program.³⁵ Moreover, best practices for fighting nonpoint source pollution are mere options and do not provide states with rigid rules.³⁶ Another CWA provision regulating storm sewer discharges allows municipalities flexibility.³⁷ But in a case involving storm sewer permits issued to Arizona governments including Phoenix, a federal appeals court determined that storm sewers need not achieve specific goals.³⁸ Regulations mandate oversight of some storm water resulting from certain industrial activities, using the NPDES (or state-equivalent) permits associated with point source pollution.³⁹ Cities also must follow storm water management programs.⁴⁰ Nonetheless, storm sewers still carry much runoff for discharge, untreated, into waterways.⁴¹

Many substances defined as pollutants commonly flow into the Salt River after rain rinses them from buildings, streets, and other surfaces in Phoenix.⁴² Automotive chemicals from roads and parking lots, soil and dust from construction sites, and litter all would require a permit if discharged through

32. See ARIZ. REV. STAT. § 45-141(A) (2018).

33. Clean Water Act § 402(b), 33 U.S.C. § 1342(b) (2018).

34. *Id.* §1329(b)(1) (specifying that states make plans for nonpoint source mitigation that the EPA administrator is empowered to accept or reject).

35. EPA 2019, *supra* note 11, at 55.

36. Curtis, *supra* note 21, at 56. The article concludes that state nonpoint source controls require strong federal oversight to be effective. *Id.* at 82.

37. Harrop, *supra* note 8, at 772–73 (citing Clean Water Act § 402(p), 33 U.S.C. § 1342(p) (2018)).

38. *Id.* at 773 (citing *Defs. of Wildlife v. Browner*, 191 F.3d 1159, 1166 (9th Cir. 1999), *amended by* 197 F.3d 1035 (9th Cir. 1999)).

39. See 40 C.F.R. § 122.26(b)(14)(i)–(xi) (2018); see also *Stormwater Discharges from Industrial Activities*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/stormwater-discharges-industrial-activities> (last visited Oct. 26, 2018).

40. *Stormwater Discharges from Municipal Sources*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources> (last visited Oct. 26, 2018).

41. *Id.*

42. Clean Water Act § 502(6), 33 U.S.C. § 1362(6) (2018) (“‘[P]ollutant’ means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste . . .”).

a point source—a discrete conveyance such as a pipe.⁴³ Point sources are tightly regulated, but few binding rules mandate specific storm water runoff cleanup efforts. The CWA definition of “pollutant” does not include nonpoint sources collected in storm sewers.⁴⁴

Nonporous urban pavement conveys more polluted water than porous surfaces, so cities can reduce pollution with natural surfaces that support vegetation and allow water to soak into the earth.⁴⁵ The chemicals, soil, and litter on city streets and properties mix with natural precipitation, and the runoff can carry larger debris and litter as it accumulates on nonporous surfaces.⁴⁶ The water flows toward a drain to the storm sewers⁴⁷ because municipalities and developers design drainage systems to clear storm water and prevent flooding of streets and buildings.⁴⁸ From there, the water and pollutants empty into surrounding streams, rivers, and lakes, often untreated.⁴⁹ The EPA plans to provide around \$67,000 more to Arizona for pollution-control infrastructure development in the 2019 plan.⁵⁰ But the 2018 infrastructure development total of \$9.2 million would still give Arizona about \$6.7 million less than the state had in 2016.⁵¹

Although Phoenix, in the Sonoran Desert, receives less rainfall than most major American cities, with 8.04 inches per year on average,⁵² city rain water significantly pollutes the Salt River, a drinking water source.⁵³ Phoenix data on storm sewer discharges into the Salt River show the level of *E. coli* bacteria has been elevated above standard water quality samples each year

43. *Id.* § 1362(14).

44. *Section 319: Nonpoint Source Pollution*, U.S. ENVTL. PROT. AGENCY, https://cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_object_id=2788 (last visited Oct. 26, 2018) (“All nonpoint sources of pollution are caused by runoff of precipitation . . .”).

45. *See* U.S. ENVTL. PROT. AGENCY, PROTECTING WATER QUALITY FROM URBAN RUNOFF 1 (2003), https://www3.epa.gov/npdes/pubs/nps_urban-facts_final.pdf.

46. Harrop, *supra* note 8, at 770.

47. *Id.* at 769–70.

48. MARICOPA CTY., DRAINAGE POLICIES AND STANDARDS FOR MARICOPA COUNTY, ARIZONA 15 (2018), <https://www.maricopa.gov/DocumentCenter/View/2369/2016-03-Drainage-Policies-and-Standards-Manual-for-Maricopa-County-PDF>.

49. *See Only Rain in the Storm Drain*, CITY PHX., <https://www.phoenix.gov/waterservices/envservices/stormwater-program/interactive> (follow “residential”) (last visited Oct. 26, 2018) (“Rain can carry pollution from our yards and driveways into the streets and storm drain system where it flows UNTREATED to the environment.”).

50. EPA 2019, *supra* note 11, at 67.

51. *Id.*

52. *Weather Data of Phoenix*, U.S. CLIMATE DATA, <https://www.usclimatedata.com/climate/phoenix/arizona/united-states/usaz0166> (last visited Oct. 26, 2018).

53. *See Report of Runoff*, WATERSHED CONNECTION, <http://data.hydrimetdataservice.info/dwr/report.aspx> (last visited Oct. 26, 2018).

since at least 2011–2012.⁵⁴ Those bacteria may cause digestive illnesses.⁵⁵ Lead and copper, which can cause illnesses or neurological problems,⁵⁶ also consistently exceeded the standard.⁵⁷ Phoenix has spent from \$4.4 million to more than \$7 million per year to monitor storm discharges and run management programs.⁵⁸ Still, the city may be overlooking pollutants.⁵⁹

Arizona has carefully marshalled its water resources, placing restrictions on ground water withdrawals to maintain sustainable water levels, but pollution concerns persist.⁶⁰ Arizona also arranged for canals to bring Colorado River water to populated areas.⁶¹ Although the state has stored more than one trillion gallons of water to offset shortages,⁶² all of its surface waterways are over-appropriated in its prior appropriation water distribution scheme.⁶³ These demands make it unlikely that a larger supply of water will

54. CITY OF PHX., 2017 ANNUAL REPORT 69 (2017), <https://www.phoenix.gov/waterservicessite/Documents/2017%20Stormwater%20Annual%20Report.pdf> (displaying the latest figures available detailing city efforts to monitor discharge from city storm sewers into local waterways).

55. *E. Coli (Escherichia Coli)*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/ecoli/general/index.html> (last updated Feb. 26, 2018) (discussing health effects of exposure to some *E. coli*, including diarrhea).

56. Nat'l Inst. for Occupational Safety & Health, *Information for Workers: Health Problems Caused by Lead*, CTRS. FOR DISEASE CONTROL & PREVENTION, <https://www.cdc.gov/niosh/topics/lead/health.html> (last updated Apr. 19, 2017) (detailing lead exposure effects, including abdominal pain, memory loss, and further neurological effects in children); *see also* COMM. ON COPPER IN DRINKING WATER, NAT'L RESEARCH COUNCIL, COPPER IN DRINKING WATER 78–87 (2000), https://www.ncbi.nlm.nih.gov/books/NBK225397/pdf/Bookshelf_NBK225397.pdf (discussing copper-induced headaches and gastrointestinal problems).

57. CITY OF PHX., *supra* note 54, at 70.

58. *Id.* at 121.

59. *See* L. Allan James, *Non-Point Source Pollution and the Clean Water Act: Policy Problems and Professional Prospects*, 126 WATER RESOURCES UPDATE 60, 61–62 (2003) (discussing incomplete federal and state nonpoint source monitoring standards).

60. ARIZ. DEP'T OF WATER RES., OVERVIEW OF THE ARIZONA GROUNDWATER MANAGEMENT CODE I (explaining the concern about rapid groundwater depletion that led to regulations). *But see* Paul Hirt et al., *The Mirage in the Valley of the Sun*, 13 ENVTL. HIST. 482, 483 (2008) (arguing that the landmark Groundwater Management Act became less effective since its 1980 enactment, taking Arizona “off the path toward sustainability.”). The urban valley’s expected growth may require a shift from the current booming growth to greater caution in allocating water resources. *Id.* at 483–84.

61. *See* CENT. ARIZ. PROJECT, COLORADO RIVER SHORTAGE: IMPACTS ON ARIZONA (2015), <http://www.cap-az.com/documents/shortage/Shortage-Fact-Sheet.pdf>. Lake Mead, the Colorado River reservoir, has been shrinking amid a serious drought. If conditions worsen enough, Arizona might lose 104 billion to 156 billion gallons of river water. *Id.*

62. *Id.*

63. *See* Rhett B. Larson & Kelly Kennedy, *Bankrupt Rivers*, 49 U.C. DAVIS L. REV. 1335, 1338 (2016) (noting that the years-long general stream adjudication of Arizona’s Gila River, of

be designated to remain in the Salt River to dilute pollution and reduce its impact.⁶⁴

B. The History of Environmental Regulation

An examination of environmental law history can help identify a new mode of nonpoint source control to mitigate toxic urban runoff. This section summarizes: 1) the reactive, nuisance origins of environmental law; 2) courts' hesitation to heed states' requests to avoid environmental damage; 3) early, primarily state-driven statutes and their reactive approach to pollution; and 4) the historical effect of the EPA's preventive federal water quality controls currently in place and the pollutants the regime declined to fully regulate.

1. Early Environmental Enforcement: Reactive Nuisance Approach

The smokestacks, railroads, ore refinement, and population booms of the Industrial Revolution damaged the nation's natural resources, ushering in the tentative dawn of environmental law.⁶⁵ Nuisance lawsuits, rather than any form of preemptive regulation, were the earliest American efforts to address environmental damage.⁶⁶ Courts proved to be safe havens for industries, favoring economic benefits over perceived lower-value farming, and higher-profile state claims over individuals' lesser-known harms.⁶⁷

In the foundational era of the early 1900s, courts refrained from demanding protection against storm-water-like, low-profile, incremental environmental deterioration of private property, even if similar cases

which the Salt River is a tributary, is hampered by the river's insufficiency to satisfy all water claims); *see also* Sharon Megdal et al., *The Forgotten Sector: Arizona Water Law and the Environment*, 1 ARIZ. J. ENVTL. L. & POL'Y 243, 265 (2011) (explaining that under prior appropriation rules, "[t]he first person to take water and apply it to a beneficial use acquired a property right or an appropriation in that amount of water.").

64. *But see* Tex. Mun. Power Agency v. Adm'r of U.S. Env'tl. Prot. Agency, 836 F.2d 1482, 1488 n.30 (5th Cir. 1988) (showing that environmental officials sought the reduction, not less-effective dispersal, of pollutants since the early 1970s, when the Environmental Protection Agency administrator said, "we don't believe that the solution to pollution is dilution"). Pollutants might still be harmful even in lower concentrations after water treatment. *Id.* at 1489.

65. Donnelly W. Hadden, *Legal Control of the Environment*, 73 MICH. B.J. 1032, 1032-33 (1994).

66. *Id.* at 1034.

67. *See, e.g.,* Georgia v. Tenn. Copper Co., 206 U.S. 230, 237 (1907) ("If the state has a case at all, it is somewhat more certainly entitled to specific relief than a private party might be.").

punished high-profile harm that attracted states' attention.⁶⁸ Twin nuisance complaints arose from roasting of copper ore to extract the metal, which released toxic fumes and destroyed vegetation in surrounding wilderness and farms.⁶⁹ In *Madison v. Ducktown Sulphur, Copper & Iron Co.*, the earlier case, the plaintiffs were private landowners.⁷⁰ Noxious ore smoke thwarted residents' farming and lumber activities and damaged their home values.⁷¹ But the Tennessee Supreme Court allowed only some tort compensation, refusing to significantly slow down the industry or force it to adopt cleaner methods.⁷²

States, by contrast, fared better in higher-profile environmental claims involving massive damage with an identifiable culprit.⁷³ In *Georgia v. Tennessee Copper Co.*, a later copper ore extraction case, the plaintiff was "a state . . . in its capacity of quasi-sovereign."⁷⁴ The Court protected the state's interest in its environment, ruling on the basis of federalism: "The States, by entering the Union, did not sink to the position of private owners . . ."⁷⁵ Justice John Marshall Harlan's concurrence provided some hope for private nuisance claims,⁷⁶ but environmental law's development proceeded with larger-scale state claims discussed below.

Courts generally employed reactionary tort remedies for visible environmental damage with a clear source rather than issuing injunctions to prevent or halt harmful activity that contributed, as with nonpoint source pollution, less obviously to environmental degradation.⁷⁷ In the first of two opinions in a case concerning the transfer of sewage from Illinois to Missouri

68. See *id.* at 238 ("It is a fair and reasonable demand on the part of a sovereign that the air over its territory should not be polluted on a great scale by sulphurous acid gas . . ."); *Madison v. Ducktown Sulphur, Copper & Iron Co.*, 83 S.W. 658, 666–67 (Tenn. 1904) ("In order to protect by injunction several small tracts of land, aggregating in value less than \$1,000, we are asked to destroy other property worth nearly \$2,000,000, and wreck two great mining and manufacturing enterprises . . .").

69. *Tenn. Copper Co.*, 206 U.S. at 236; *Madison*, 83 S.W. at 659.

70. *Madison*, 83 S.W. at 659 ("These lands are all thin mountain lands, of little agricultural value.").

71. *Id.*

72. *Id.* at 667.

73. See, e.g., *Tenn. Copper Co.*, 206 U.S. at 238–39.

74. *Id.* at 237.

75. *Id.* at 237–38.

76. *Id.* at 240 (Harlan, J., concurring) ("Georgia is entitled to the relief sought, not because it is a State, but because it is a *party* which has established its right to such relief by proof." (emphasis added)).

77. See Thomas W. Merrill, *Golden Rules for Transboundary Pollution*, 46 DUKE L.J. 931, 940–41 (1997) (discussing transboundary pollution cases in which the U.S. Supreme Court had original, rather than appellate, jurisdiction).

via the Mississippi River, the Supreme Court only hinted at a preventive approach to environmental damage.⁷⁸ Illinois had dug a canal to transport sewage in to the river, which it planned to use regularly.⁷⁹ The Court's dismissal of Illinois's demurrers indicated some support for a proactive pollution approach.⁸⁰ But the three-Justice dissent indicated strong support for a reactionary approach of checking for damage after polluting operations.⁸¹ In the second opinion, the Court noted that Missouri claimed that sewage flowing from Illinois was exposing its residents to typhus.⁸² The Court dismissed the complaint, refusing to punish the polluter, Illinois.⁸³ It insisted instead that the plaintiff, Missouri, filter the water to protect against contaminants.⁸⁴ It reasoned that Illinois' sewage dilution with Lake Michigan water seemed to improve water quality, and Missouri failed to establish that Illinois caused Missouri's typhus surge.⁸⁵ Thus, the Court abandoned the possible preventive approach to environmental policy in favor of tort principles.

2. Higher Burdens for State Plaintiffs in Nuisance Claims

Fifteen years later, the Supreme Court required an even higher bar to win relief, requiring a showing that a particular polluter caused definable damage, rather than the kind of incremental degradation that characterizes nonpoint source pollution.⁸⁶ In *New York v. New Jersey*, the Court demanded clear and convincing evidence to prevent another discharge of sewage.⁸⁷ The Court held that New York failed to prove that the sewage discharge New Jersey planned to deposit into the New York Bay would disrupt navigability and property use enough to constitute a public nuisance.⁸⁸ New York alleged that the sewer would render the water unfit for bathing, damage ships, and poison

78. *Missouri v. Illinois (Missouri I)*, 180 U.S. 208, 248 (1901).

79. *Id.* at 228–29.

80. *Id.*

81. *Id.* at 249–50 (Fuller, C.J., dissenting).

82. *Missouri v. Illinois (Missouri II)*, 200 U.S. 496, 522–23 (1906); *Missouri I*, 180 U.S. at 241.

83. *Missouri II*, 200 U.S. at 525–26 (“[It is] at least uncertain how much of the present pollution is due to Chicago and how much to sources further down, not complained of in the bill.”).

84. *Id.*

85. *Id.*

86. *New York v. New Jersey*, 256 U.S. 296, 312–13 (1921).

87. *Id.* at 306–07, 309 (declining to accept the contention that proposed treatment would be insufficient and result in damage of indiscernible origin).

88. *Id.* at 312–13.

any food supplies that the bay provided.⁸⁹ But the Court refused to stop New Jersey until New York could demonstrate that the operation damaged the bay's waters to the extent that the state's economy and health were threatened.⁹⁰

Even cases decided against polluters demonstrated the courts' reactive approaches to pollution that failed to prevent significant environmental degradation. In *New Jersey v. City of New York*, the city was dumping garbage into the sea, and the wind carried trash back to accumulate on a beach and nearby water, disrupting bathing.⁹¹ The Supreme Court of the United States held that the city must stop dumping its garbage into the sea and build incinerators for waste disposal instead.⁹² Rather than a preventive regime safeguarding a clean environment in advance, however, this remedy arose only after "many years" of dumping had befouled New Jersey's beaches.⁹³ Moreover, immediate economic rather than conservation values underpinned the Court's decision, as the beaches were worth millions of dollars, and the garbage disrupted commercial fishing.⁹⁴

Even if courts were warmer toward environmental damage claims against wealth- and employment-generating industries, many destructive practices, such as those that contribute to nonpoint source pollution, would go unchecked by the nuisance regime.⁹⁵ Claims would arise only when pollution directly, clearly harmed a plaintiff to the extent that a costly, time-consuming, uncertain court battle would be worthwhile.⁹⁶

3. Statutory Regimes Emerge, with States in Charge

Early water pollution statutes lacked the strong federal oversight of the current CWA. The approach until after World War II was limited to certain pollution, such as sewage, and states inconsistently enforced their rules.⁹⁷ The Rivers and Harbors Act of 1899 included a provision forbidding water

89. *Id.* at 302–03.

90. *Id.* at 313–14.

91. *New Jersey v. City of New York*, 283 U.S. 473, 478 (1931).

92. *Id.* at 483.

93. *Id.* at 476.

94. *Id.* at 478.

95. *See* Hadden, *supra* note 65, at 1034.

96. *Id.*

97. Jouni Paavola, *Interstate Water Pollution Problems and Elusive Federal Water Pollution Policy in the United States, 1900–1948*, 12 ENV'T & HIST. 435, 437 (2006).

pollution, criminalizing all unauthorized discharge of refuse.⁹⁸ It is an early example of proactive resource protection, but the maximum fine was only \$2,500,⁹⁹ and it did little to clean up water.¹⁰⁰ By the end of World War II in 1945, industrial waste disposal became the waterways' primary pollutants.¹⁰¹ The 1948 Water Pollution Control Act moved away from the approach of reactive compensation and signaled preventive pollutant regulations.¹⁰² Its successor, the 1965 Water Pollution Control Act, required states to enact plans to achieve federal benchmarks in interstate waters, much the way the Clean Air Act operates now.¹⁰³ The Clean Air Act gives states discretion on how to meet federal benchmarks for specified pollutants.¹⁰⁴ In 2015, the EPA reported reductions in all six specified air-degrading substances—carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide—since 1990.¹⁰⁵

With states in charge of their own water quality control efforts and limited federal oversight, early water quality statutes did little to stem the tide of water pollution, as dumping of untreated chemicals into industrial rivers flourished.¹⁰⁶ A race to the bottom for economic advantage hampered water pollution control: industry groups saw regulations as penalties.¹⁰⁷ Industries discharged into waterways under the guise that pollutants would be attenuated and neutralized in the depths of navigable waters.¹⁰⁸ But the rivers

98. Diane D. Eames, *The Refuse Act of 1899: Its Scope and Role in Control of Water Pollution*, 58 CAL. L. REV. 1444, 1457–58 (1970). The author discusses flaws in the Act, such as its silence on water cleanliness standards. *Id.* at 1446.

99. William H. Rodgers, Jr. & Elizabeth Burleson, *Air and Water*, in 2 ENVIRONMENTAL LAW 192 (2d ed. 2016).

100. Paavola, *supra* note 97, at 437.

101. *Id.* at 441.

102. *History of the Clean Water Act*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/laws-regulations/history-clean-water-act> (last visited Jan. 4, 2019).

103. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 663–64 (7th ed. 2013).

104. *Id.* at 527–28.

105. U.S. ENVTL. PROT. AGENCY, OUR NATION'S AIR: STATUS AND TRENDS THROUGH 2015, <https://gispub.epa.gov/air/trendsreport/2016/> (last visited Oct. 27, 2018).

106. See, e.g., Jennifer Latson, *The Burning River That Sparked a Revolution*, TIME (June 22, 2015), <http://time.com/3921976/cuyahoga-fire>.

107. Paavola, *supra* note 97, at 442 (citing *We Believe in Clean Streams, But—Say the Polluters Who Are Opposing the Lonergan Legislation*, 1 OUTDOOR AM. 7 (1936) (“It is always defeated by the Pennsylvania Manufacturers’ Association, with this argument: that to pass such a bill would penalise Pennsylvania industries and put them at competitive disadvantage with the industries of New York, New Jersey, West Virginia and other adjoining states.”)).

108. See John H. Minan, *Municipal Separate Storm Sewer System (MS4) Regulation Under the Federal Clean Water Act: The Role of Water Quality Standards?*, 42 SAN DIEGO L. REV. 1215, 1226 (2005).

deteriorated as state pollution control agencies refused to slow discharges into waterways deemed to be for industrial uses.¹⁰⁹ Preventive environmental regulation failed to prevent environmental damage when the economic balance tipped in favor of paying fines rather than polluting.¹¹⁰ Ecosystems suffered, with massive fish kills resulting from widespread discharge of untreated industrial waste.¹¹¹ In some cases, the water became so volatile that industrial rivers caught fire, most famously the relatively minor burning of Cleveland's Cuyahoga River in 1969.¹¹²

That blaze contributed to the outrage that forced the federal government to begin healing the environment.¹¹³ Before the 1960s, the environment was not a popular concern because people were relatively ignorant about environmental damage,¹¹⁴ and before the dawning of environmental consciousness, polluted rivers only sparked concern if the problems threatened navigability.¹¹⁵ But by the Environmental Decade of the 1970s, political leaders were poised for action. Senator Edmund Muskie, a Maine Democrat, sponsored the legislation to overhaul the American system of water quality enforcement that he characterized as weak.¹¹⁶ He highlighted the magnitude of the cleanup effort ahead: "Today, the rivers of this country serve as little more than sewers to the seas. Wastes from cities and towns . . . foul the streams . . ." ¹¹⁷ Vast changes in environmental stewardship were about to surface.

4. The 1972 Clean Water Act's Results

The Environmental Protection Agency began successfully cleaning up the water during President Richard Nixon's administration in 1970 as Congress was crafting the major environmental statutes in effect today.¹¹⁸ The National Environmental Policy Act forced developers to disclose the issues created by

109. Paavola, *supra* note 97, at 443.

110. *See, e.g., Reynolds Metals Co. v. Lampert*, 324 F.2d 465, 466 (9th Cir. 1963) ("It is cheaper to pay claims than it is to control fluorides.").

111. Andreen, *supra* note 3, at 25.

112. Jonathan H. Adler, *Fables of the Cuyahoga: Reconstructing a History of Environmental Protection*, 14 *FORDHAM ENVTL. L.J.* 89, 95 (2002).

113. *See id.* at 139.

114. *See id.* at 140.

115. *Id.* at 104.

116. William L. Andreen, *Beyond Words of Exhortation: The Congressional Prescription for Vigorous Federal Enforcement of the Clean Water Act*, 55 *GEO. WASH. L. REV.* 202, 229 (1987).

117. *Id.* (quoting 117 *CONG. REC.* 38,797-802 (1971)).

118. *See* Richard N.L. Andrews, *The EPA at 40: An Historical Perspective*, 21 *DUKE ENVTL. L. & POL'Y F.* 223, 223 (2011).

projects with major environmental impacts and explore alternatives.¹¹⁹ The CWA, enacted in 1972, has been called a success story.¹²⁰ It has promoted environmental healing, some argue, without injuring the economy.¹²¹

However, it has not succeeded in its mission of eliminating discharge of pollutants into navigable waters by 1985.¹²² Its success in reducing pollution from point sources, such as pipes, has not extended to nonpoint source pollution, such as urban storm water runoff.¹²³ The 1987 amendments to the CWA added city storm sewers to the list of point sources requiring permits and oversight by the federal government or states.¹²⁴ Nonetheless, the runoff water laden with urban pollutants they convey is not treated before it winds up in natural watercourses.¹²⁵ The majority of rivers surveyed in 2010 remained too polluted to fully perform their primary purposes, and municipal discharges are a major culprit.¹²⁶ A storm washes the chemicals, detergents, motor oil, debris, and other pollutants from city streets into their storm water systems, which conveys the untreated urban storm runoff into natural

119. *National Environmental Policy Act Review Process*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/nepa/national-environmental-policy-act-review-process> (last visited Oct. 21, 2018).

120. Andreen, *supra* note 3, at 26 (“Both municipal and industrial discharges have declined sharply, the loss of wetlands has been cut decisively, and water quality has broadly improved across the country.” (footnotes omitted)).

121. *Id.*; see also William L. Andreen, *Water Quality Today—Has the Clean Water Act Been a Success?*, 55 ALA. L. REV. 537, 577 (2004) (“[T]here is no evidence indicating that our overall expenditure on environmental protection has adversely affected either the American economy or the nation’s competitiveness.” (citing CONG. BUDGET OFFICE, CONG. OF THE U.S., ENVIRONMENTAL REGULATION AND ECONOMIC EFFICIENCY 77 (1985) (“U.S. economic performance in general has not been reduced relative to other nations because of environmental regulation.”))). But see Randolph M. Lyon & Scott Farrow, *An Economic Analysis of Clean Water Act Issues*, 31 WATER RESOURCES RES. 213, 222 (1995) (“[T]his study suggests that clean water programs . . . may have incremental costs that will exceed incremental benefits Importantly, the finding of apparent negative incremental national net benefits does not imply that all new clean water programs would be inefficient.”).

122. 33 U.S.C. § 1251(a)(1) (2018); see also *id.* § 1251(a)(7) (“[P]rograms for the control of nonpoint sources of pollution [will] be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution.”).

123. Oliver A. Houck, *TMDLs IV: The Final Frontier*, 29 ENVTL. L. REP. 10,469, 10,470–71 (1999).

124. Roopika ranian, *Rained Out: Problems and Solutions for Managing Urban Stormwater Runoff*, 43 ECOLOGY L.Q. 421, 423–24 (2016).

125. *Stormwater Discharges from Municipal Sources*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources> (last visited Oct. 21, 2018).

126. Andreen, *supra* note 3, at 30.

waterways.¹²⁷ “The EPA estimates that American households improperly dump about 193 million gallons of used oil every year, or roughly the equivalent of 17 Exxon Valdez oil spills.”¹²⁸ That pollutant and others kill aquatic life and can endanger humans who use the waterways for recreation or for drinking water.¹²⁹

The government has prioritized the CWA’s mandate to reduce clear, visible pollution traceable to particular entities over the diffuse, difficult-to-trace nonpoint source pollution.¹³⁰ “[I]ndustrial discharges to the nation’s waters are precipitously down [and] rates of wetland loss have slowed and in some regions even reversed”¹³¹ Still, the under-regulation of urban storm water runoff remains among the biggest threats to the nation’s, and Arizona’s, waters.¹³² Although the 1987 amendments created permitting requirements for city storm sewer systems,¹³³ the sewers remain an exception to the CWA’s general success.¹³⁴ Regulators and stakeholders are fighting the ongoing pollution problems with Total Maximum Daily Load limits on pollutants that may enter waterways.¹³⁵ Adding green infrastructure also enables more natural handling of storm water, so water can reach the earth through porous surfaces, which help filter out pollutants and prevents damaging surges of dirty water.¹³⁶

C. *The Current State of Environmental Regulation*

To identify strategies to advance the reduction of nonpoint source pollution, this section examines: 1) the particular difficulties for arid Arizona to maintain high-quality surface water; 2) local and private Phoenix-area water pollution mitigation; 3) the federal government’s message of increasing

127. NPDES Permits & Stormwater, U.S. ENVTL. PROT. AGENCY, <https://www3.epa.gov/region9/water/npdes/stormwater-feature.html> (last visited Oct. 21, 2018).

128. *Id.*

129. *Id.*

130. See Houck, *supra* note 123, at 10,471.

131. *Id.* at 10,469 (footnotes omitted).

132. See Andreen, *supra* note 3, at 27; Houck, *supra* note 123, at 10,471.

133. Alexandra Dapolito Dunn & David W. Burchmore, *Regulating Municipal Separate Storm Sewer Systems*, 21 NAT. RESOURCES & ENV’T 3, 3 (2007).

134. See *id.* at 5 (“[S]ome U.S. cities are struggling with failed or failing [storm sewer] systems and, as a result, the reality of fines and other penalties for noncompliance with their existing [storm sewer] permits.”).

135. Houck, *supra* note 123, at 10,473.

136. U.S. ENVTL. PROT. AGENCY, GREEN INFRASTRUCTURE BARRIERS AND OPPORTUNITIES IN PHOENIX, ARIZONA, at ii (2013), https://www.epa.gov/sites/production/files/2015-10/documents/phoenix_gi_evaluation.pdf.

state and local responsibility for environmental quality; and 4) the potential for expanding public information efforts to encourage nonpoint source pollution prevention.

1. Persistent Pollution of Arizona Rivers

Arizona's waterways are heavily polluted, largely due to massive extraction of water.¹³⁷ With less water in its streams, pollutants do not disperse as well to mitigate their toxic effects.¹³⁸ Arizona's constitutionally mandated prior appropriation regime of water distribution incentivizes massive withdrawal because it punishes failure to use full water rights with forfeiture.¹³⁹ It also gives constitutional weight to established water rights, thus limiting any reductions of those water rights for environmental recovery.¹⁴⁰ Instream flows remain for environmental protection only if someone exercises a water right for that purpose.¹⁴¹ Arizona has a commitment to withdrawing water from natural watercourses and storing it underground.¹⁴² Prior appropriation does not incentivize preserving water for instream flows but punishes those who fail to appropriate all of their water for their usual purpose with possible forfeiture.¹⁴³

Phoenix's storm sewers drain water from city streets into surrounding waterways.¹⁴⁴ The nearby Salt River receives elevated levels of some pollutants through the storm sewers.¹⁴⁵ This introduces urban runoff into the

137. Megdal et al., *supra* note 63, at 245–46.

138. See Thomas W. Fitzhugh & Brian D. Richter, *Quenching Urban Thirst: Growing Cities and Their Impacts on Freshwater Ecosystems*, 54 *BIOSCIENCE* 741, 750 (2004) (“Water pollution is a serious problem in the Chattahoochee River near Atlanta and could become worse if increased consumption of water . . . reduces its dilution capacity.” (citation omitted)).

139. See ARIZ. CONST. art. XVII, § 1; Megdal et al., *supra* note 63, at 266 (“As long as an appropriator is using water beneficially, the appropriator holds that water right. But once the appropriator fails to make such a use, the right is lost.”).

140. See ARIZ. CONST. art. XVII, § 2.

141. See Megdal et al., *supra* note 63, at 246.

142. *Background*, ARIZ. WATER BANKING AUTH., <http://www.azwaterbank.gov/Background/> (last visited Oct. 26, 2018).

143. Aaron Citron, *Working Rivers and Working Landscapes: Using Short-Term Water Use Agreements to Conserve Arizona's Riparian and Agricultural Heritage*, 1 *ARIZ. J. ENVTL. L. & POL'Y* 7, 21 (2010).

144. WATER SERVICES DEP'T, CITY OF PHX, ANNUAL REPORT FOR AZPDES PERMIT NO. AZS000003, MUNICIPAL SEPARATE STORM SEWER SYSTEM 40–50 (2016), <https://www.phoenix.gov/waterservicessite/Documents/2016%20Stormwater%20Annual%20Report%20Revised.pdf> (listing storm water discharge sites in Phoenix and their receiving surface waterways).

145. See *supra* notes 53–59 and accompanying text.

waterways¹⁴⁶ and rapidly alters their flow, potentially damaging them ecologically.¹⁴⁷ Green infrastructure, such as permeable pavements and water-absorbing plants, can reduce this risk.¹⁴⁸ Experts have identified it as a way to improve urban storm water handling,¹⁴⁹ but the regulatory framework does not strongly incentivize green infrastructure.¹⁵⁰

2. Local Green Infrastructure Initiatives

Community groups are placing their own green infrastructure to help keep pollution away from rivers. In 2011, the Arizona-based Watershed

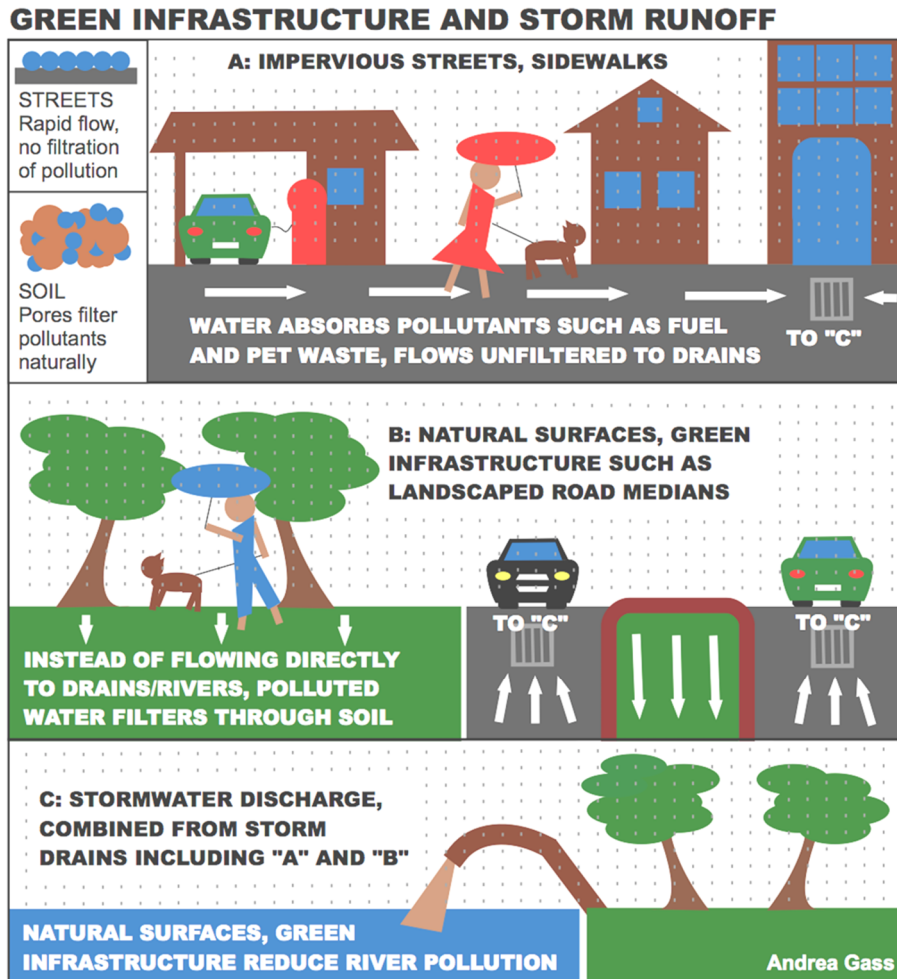
146. Subramanian, *supra* note 124, at 423.

147. *Id.* at 429.

148. *Id.* at 432.

149. *Id.* at 443.

150. *Id.* at 433.



Management Group, which counts the EPA as a major funding source,¹⁵¹ led its first green infrastructure project just five years earlier, a water-harvesting landscaping effort at a Phoenix church.¹⁵² The project added curb cuts and water absorbing trees to help control storm water runoff and keep pollution out of waterways.¹⁵³

151. *Partners and Major Funders*, WATERSHED MGMT. GRP., <https://watershedmg.org/partners-and-funders> (last visited Oct. 26, 2018).

152. *Growing Life and Community at Primera Iglesia*, WATERSHED MGMT. GRP., <https://watershedmg.org/article/growing-life-and-community-primera-igl%C3%A9sia> (last visited Oct. 26, 2018)

153. *Id.*

Phoenix green infrastructure has garnered mixed appraisals. In 2013, Tetra Tech identified plans to reduce impervious surfaces, regulations on maintenance of plant life for new developments, and storm water requirements for new developments as Phoenix's strengths in green infrastructure.¹⁵⁴ Conversely, its weaknesses include lack of protections for plant life and plans to incorporate green infrastructure in existing developments and overly large, impervious streets and parking areas.¹⁵⁵ Also in 2013, the EPA reviewed Phoenix green infrastructure policies and results. It found that while new developments are helping with storm water retention and cleanup, Phoenix is less successful in retrofitting existing properties.¹⁵⁶ The city was among the recipients of EPA grants to support green infrastructure development.¹⁵⁷

Impervious surfaces have emerged as a clear target for environmental improvement. The EPA noted progress in Phoenix implementing green infrastructure in 2013 but noted potentially costly, ongoing problems for storm water management, including the city's wide streets and large parking lots.¹⁵⁸ In 2016, the Watershed Management Group, with United States Agriculture Department and state support, led Phoenix employees in a training session on green infrastructure design.¹⁵⁹ Phoenix closely monitors its storm sewer system and makes extensive reports¹⁶⁰ on outreach efforts and results to the Arizona Department of Environmental Quality, which oversees the city's storm sewer permit in place of the EPA, and is bound to uphold at least the same standards for point source discharges that the federal government mandates.¹⁶¹

154. TETRA TECH, CITY OF PHOENIX CODE REVIEW TO PROMOTE GREEN INFRASTRUCTURE—CASE STUDY 4 (2013), https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/PHX_Code%20review%20to%20promote%20green%20infrastructure%20case%20study.pdf.

155. *Id.* at 5.

156. U.S. ENVTL. PROT. AGENCY, *supra* note 136, at 11.

157. *Id.* at ii.

158. *Id.* at 4–5.

159. *Phoenix Green Infrastructure Training 2016*, WATERSHED MGMT. GRP., <https://watershedmg.org/gallery/phoenix-green-infrastructure-training-2016> (last visited Oct. 26, 2018).

160. WATER SERVICES DEP'T, *supra* note 144, at 3.

161. See 40 C.F.R. § 122.26 (2018); 40 C.F.R. § 123 (2018); ARIZ. ADMIN. CODE § 18-9-9 (2018); PHX. CITY CODE § 32C-104 (2018), <http://www.codepublishing.com/AZ/Phoenix/html/Phoenix32C/Phoenix32C104.html#32C-104>; *National Pollutant Discharge Elimination System State Program Information*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/npdes-state-program-information> (last visited Oct. 26, 2018).

Impervious surfaces also cause flooding when Phoenix receives rain because excess water cannot soak into the earth.¹⁶² In 2014, heavy rain flooded 200 Phoenix homes.¹⁶³ The authors of a study of Phoenix flooding suggested solutions including storm water retention basins with vegetation, which is also a strategy for controlling pollutants.¹⁶⁴ Houses along the city's Foote Drive flooded multiple times in a few years.¹⁶⁵ Residents in flood-prone areas complain about drainage, but officials said improvements are not immediately feasible because pipes are too small.¹⁶⁶ City officials contended that a money shortage prevents a drainage upgrade.¹⁶⁷ A storm water retention basin to alleviate problems cost \$4.5 million.¹⁶⁸

For arid Arizona, every waterway is critical, and water rights holders have fully appropriated or overburdened most of them.¹⁶⁹ The Ninth Circuit Court of Appeals allowed Phoenix and other nearby cities to operate storm sewers not adhering to state standards for point sources, finding that the CWA intentionally used discretionary language.¹⁷⁰ Despite all of these efforts, the Phoenix-area Salt River contains bacteria such as *E. coli* and other contaminants such as selenium.¹⁷¹ Cleaning up and protecting the purity of Arizona's surface water from the type of pollutants urban runoff carries is key for ecology and the future of the city alike.¹⁷²

162. See Yeowon Kim et al., *Fail-Safe and Safe-to-Fail Adaptation: Decision-Making for Urban Flooding Under Climate Change*, 145 CLIMATIC CHANGE 397, 398 (2017).

163. *Id.* at 402.

164. See *id.* at 406.

165. Donna Rossi, *No Solutions for Neighborhood Plagued by Floods*, AZFAMILY.COM (Aug. 9, 2017, 8:37 PM), <https://web.archive.org/web/20170810061613/http://www.azfamily.com/story/36102826/no-solutions-for-neighborhood-plagued-by-floods>.

166. *Id.*

167. *Id.*

168. Donna Rossi, *South Phoenix Retention Basin Provides Little Comfort for Flood Victims*, AZFAMILY.COM (Dec. 8, 2016, 8:35 PM), <https://web.archive.org/web/20161210145327/http://www.azfamily.com/story/34012013/south-phoenix-retention-basin-provides-little-comfort-for-flood-victims>.

169. Citron, *supra* note 143, at 18, 22; see also Lauren Podgorski, Comment, *From Wine to Water: Wet Markets for Dry Times*, 51 ARIZ. ST. L.J. (forthcoming 2019) (detailing privately administered volunteer efforts to preserve flows in Verde River, one of Arizona's last healthy rivers).

170. *Defs. of Wildlife v. Browner*, 191 F.3d 1159, 1165–66 (9th Cir. 1999) (“[A CWA] provision gives the EPA discretion to determine what pollution controls are appropriate.”).

171. ARIZ. DEP'T OF ENVTL. QUALITY, APPENDIX C: ARIZONA'S 2016 IMPAIRED WATERS 3, http://legacy.azdeq.gov/environ/water/assessment/download/appendix_c2016.pdf.

172. Megdal et al., *supra* note 63, at 248–49.

3. Potential Delegation of Regulation to Local and State Governments

However, the federal government may be reducing support for water pollution control. Under the Trump administration, the EPA is signaling an attempt to return to state control of pollutant discharges. In both the 2018 and 2019 budget proposals, the EPA proposed billions of dollars in cuts for environmental enforcement at the federal level.¹⁷³ The EPA cannot regulate many of the factors that lead to dirty storm water transferring from Phoenix to Arizona waterways.¹⁷⁴ And its capacity to regulate will likely diminish with funding cuts for water pollution enforcement efforts as part of a proposed drawdown by \$1.9 billion in the 2019 budget proposal.¹⁷⁵

The \$6.1 billion 2019 plan would be the lowest level of EPA spending since 1991.¹⁷⁶ The plan identifies a focus on infrastructure projects for drinking water and wastewater treatment.¹⁷⁷ However, the 2019 plan emphasizes “flexibility” for states rather than strict enforcement of statutory requirements.¹⁷⁸ In the 2018 budget, the EPA suggested a reduced role for the federal agency: “Responsibility for funding local environmental efforts and programs is returned to state and local entities”¹⁷⁹ However, in the 2019 plan, the EPA plans to oversee revisions to regulations to reduce lead and copper, which are among the pollutants damaging the Salt River, indicating the continued importance of strong federal guidance.¹⁸⁰ In total, the 2019 budget proposal plans to cut more than \$29 million from water ecosystems protection.¹⁸¹ It also proposes reducing Human Health Protection by more than \$17 million and Water Quality protection spending by more than \$34 million.¹⁸² Finally, despite its emphasis on assisting the states, the 2019 budget plans to cut Water Pollution Control Categorical Grants from \$422.8

173. EPA 2019, *supra* note 11, at 11 (proposing \$6.1 billion in spending for fiscal 2019, down from \$8 billion in 2018); EPA 2018, *supra* note 11, at 8 (proposing a \$2.5 billion reduction for fiscal 2018 from \$8.2 billion in fiscal 2017 spending).

174. Megdal et al., *supra* note 63, at 254–55 (“[T]he CWA cannot be used to protect the environment from greater quantities of pollutants if the proposed fix would interfere with established water rights.”).

175. See EPA 2019, *supra* note 11, at 11.

176. EPA’s *Budget and Spending*, ENVTL. PROT. AGENCY, <https://www.epa.gov/planandbudget/budget> (last visited Oct. 26, 2018).

177. EPA 2019, *supra* note 11, at 19.

178. *Id.*

179. EPA 2018, *supra* note 11, at 2.

180. EPA 2019, *supra* note 11, at 20.

181. *Id.* at 51.

182. *Id.*

million in 2017 to \$163.4 million in the 2019 proposal.¹⁸³ Water pollution control, in particular, faces reduction by around \$75 million from 2018 levels, or one-third of total spending to arrive at a \$153.7 million target.¹⁸⁴ Thus, federal support for enforcing clean water standards will decline. States would need to find their own funding to enact new protections against nonpoint source pollution.

More federal environmental spending could improve the environment in Arizona. The Obama administration raised EPA spending from the levels of the Bush era, but its workforce decreased.¹⁸⁵ Accounting for factors such as inflation, the EPA's budget in 2010 was not much higher than during the early 1990s.¹⁸⁶ Funding cuts will likely impact some of the local and state programs that receive federal aid and could help clean up Phoenix's storm water runoff.¹⁸⁷ Furthermore, some signs indicate that the Arizona Department of Environmental Quality will not dramatically increase efforts to make up for the reduction in federal aid. Although the state apparently declined to implement a planned \$30 million cut for the environment under the 2018 proposal, the 2019 proposal would not significantly add resources for environmental quality.¹⁸⁸ And the state plans no increased spending on water quality.¹⁸⁹ Arizona appears poised to maintain the status quo of pollution-tainted waterways.

In the past, Arizona took on resource control initiatives without federal guidance. The state Legislature designed its 1980 Groundwater Management Act to stop appropriators from pumping groundwater faster than aquifers could refill.¹⁹⁰ The 1980 Act mandates water conservation and sets restrictions on who may pump groundwater and the purposes for which they may appropriate the water.¹⁹¹ Arizona recharges its aquifers with water from

183. *Id.* at 59.

184. *Id.*

185. *EPA's Budget and Spending*, *supra* note 176.

186. Andreen, *supra* note 3, at 31.

187. *See* EPA 2018, *supra* note 11, at 35–36.

188. OFFICE OF THE ARIZ. GOVERNOR, STATE OF ARIZONA EXECUTIVE BUDGET: STATE AGENCY BUDGETS FISCAL YEAR 2019, at 140 (2018), <https://azgovernor.gov/sites/default/files/governor/documents/fy2019executivebudget-stateagencybookreduced2.pdf> [hereinafter ARIZONA 2019]; OFFICE OF THE GOVERNOR DOUG DUCEY, STATE OF ARIZONA EXECUTIVE BUDGET: STATE AGENCY BUDGETS FISCAL YEAR 2018, at 141 (2017), <https://azgovernor.gov/sites/default/files/governor/documents/executivebudget-stateagencybudgets.pdf>.

189. ARIZONA 2019, *supra* note 188, at 142.

190. Rhett Larson & Brian Payne, *Unclouding Arizona's Water Future*, 49 ARIZ. ST. L.J. 465, 483 (2017) (“Lawmakers recognized that continued and unsustainable mining of groundwater would result in harm to the state’s economy and welfare.”).

191. *Id.* at 484.

the Colorado River¹⁹² and the 1980 Act's goal is to fully offset withdrawals by pumping water back into the ground.¹⁹³ As groundwater recharges, pollutants filter out as water percolates through rocks and soil, and that reduces the need to treat surface water at facilities at a high cost.¹⁹⁴ Although the reallocation of storm water to the aquifers would avoid dumping pollutants into surface waters, Arizona rivers would lose water, and they already cannot satisfy all claims.¹⁹⁵ While the state considers how to resolve the claims on its waterways that leave the optimal distribution of storm water uncertain, the federal government can help it find the optimal solution for the environment.

Polls in Arizona suggest that people are also willing to make economic sacrifices for the sake of the environment.¹⁹⁶ However, Republicans have a solid lead over Democrats in Arizona voter registration,¹⁹⁷ and the Republican Party platform has decried the EPA's oversight of water quality as a

192. *Id.* at 467.

193. *Id.* at 483.

194. See *Recharge Program*, CENT. ARIZ. PROJECT, <https://www.cap-az.com/departments/recharge-program> (last visited Oct. 24, 2018).

195. See Larson & Kennedy, *supra* note 63, at 1338.

196. Brandon Loomis, *Poll: Arizona Overwhelmingly Supports Protecting Land, Air, Climate*, AZ CENT. (Aug. 13, 2017, 5:00 AM), <https://www.azcentral.com/story/news/local/arizona-environment/2017/08/13/arizona-residents-poll-environment-land-air-climate-protections/557559001/>. A poll by Arizona State University's Morrison Institute for public policy found that sixty-eight percent of Arizonans surveyed favored protecting the environment even if it hampers economic growth. However, state lawmakers rescinded climate change initiatives and members of Arizona's congressional delegation supported eliminating protections for Arizona's national monument land. *Id.*; see also Inst. of the Env't., *Arizona's Views on Climate Change*, UNIV. ARIZ., <http://www.environment.arizona.edu/climate-survey> (last visited Oct. 24, 2018) (finding that respondents who believe mitigating global warming would improve the state's economy).

197. *Voter Registration & Historical Election Data*, ARIZ. SEC'Y STATE, <https://www.azsos.gov/elections/voter-registration-historical-election-data> (last visited Oct. 24, 2018). Voters re-elected Republican John McCain by a comfortable margin over Democratic challenger Ann Kirkpatrick in 2016. ARIZ. SEC'Y OF STATE, STATE OF ARIZONA OFFICIAL CANVASS: 2016 GENERAL ELECTION – NOV. 8, 2016 (2016), <http://apps.azsos.gov/election/2016/General/Official%20Signed%20State%20Canvass.pdf>. McCain received a 11% score for 2017 from the League of Conservation Voters, which listed 17 “Anti-environment Votes” to 2 “Pro-environment Votes” in 2016. *National Environmental Scorecard: Senator John McCain (R)*, LEAGUE CONSERVATION VOTERS, <http://scorecard.lcv.org/moc/john-mccain> (last visited Oct. 24, 2018). But see *Arizona Senate Election Results: Martha McSally vs. Kyrsten Sinema*, N.Y. TIMES: ELECTION 2018 (Jan. 4, 2019, 2:13 AM), <https://www.nytimes.com/elections/results/arizona-senate> (detailing Arizona Democrat Kyrsten Sinema's victory by fewer than 60,000 votes over Republican Martha McSally for U.S. Senate).

“travesty” and invasion of private property.¹⁹⁸ Improving storm water quality would likely require more oversight.

4. The Public-Private Alternative

Private governance efforts have found environmental solutions that eluded traditional governments.¹⁹⁹ A green certification program can reward companies that invest in green infrastructure or otherwise reduce storm water damage with a designation denoting environmental friendliness.²⁰⁰ At little cost, the EPA and construction companies, developers, and other industries could establish targets for environmental benefits that could help relieve the waterways around Phoenix and elsewhere.²⁰¹ The most famous example of such an environmental certification regime is the Energy Star, which is a partnership between the EPA and Department of Energy created to evaluate manufacturers’ appliances for efficiency in order to determine if they earn a star label.²⁰² The star label signals to consumers that the product is environmentally friendly and cuts electric bills, thus benefitting the manufacturers as the efficient technology protects the environment.²⁰³

Sometimes, however, companies provide excessive or dubious information about environmental impact to customers, making confusing and possibly misleading claims in a practice known as “greenwashing.”²⁰⁴ Still, it can incentivize reductions in pollution that has gone unchecked for decades with less disruption to industries than a mandatory government regulation scheme.²⁰⁵ Moreover, nongovernmental groups are having an increasing effect on how businesses and individuals protect the environment²⁰⁶ as federal environmental statutes fail to advance and adapt.²⁰⁷ Enough private pressure

198. *America’s Natural Resources: Agriculture, Energy, and the Environment*, GOP, <https://gop.com/platform/americas-natural-resources> (last visited Oct. 24, 2018).

199. See Kyle W. Robisch, *Getting to the (Non)Point: Private Governance as a Solution to Nonpoint Source Pollution*, 67 VAND. L. REV. 539, 541 (2014); Podgorski, *supra* note 169 (detailing private water preservation credit system to maintain flows in Arizona’s Verde River).

200. Robisch, *supra* note 199, at 564–65.

201. *Id.* at 568.

202. *Id.* at 562.

203. *Id.* at 563.

204. See Karen Bradshaw Schulz, *Information Flooding*, 48 IND. L. REV. 755, 763 (2015).

205. Robisch, *supra* note 199, at 566.

206. Michael P. Vandenbergh, *Private Environmental Governance*, 99 CORNELL L. REV. 129, 133 (2013) (“[E]nvironmental preferences have been expressed not just through the political process . . . but also through private interactions in social settings and the marketplace.”).

207. *Id.* at 132.

could prompt contributors to clean up problems without government interference.

III. WHAT IS THE SOLUTION?

Dryness and urban sprawl account for Phoenix's difficulties in meeting the CWA's objective "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."²⁰⁸ But improved surface water can reduce health risks, improve recreation, and foster a more sustainable water system for the largest American desert city.

This section discusses the disparity of success in regulating point source and nonpoint source pollution at the federal level. It also considers the likely continuation of that problem under a plan to delegate nonpoint source pollution to the states and local efforts. Finally, it proposes a federal-state partnership to enable effective controls based on specialized local concerns while preventing lapses resulting from lack of local political will.

A. Chronic Problem: Lack of Nonpoint Pollution Oversight

History provides no easy solution to the problem of polluted urban storm water runoff. No early environmental efforts addressed the problem of individually minor agricultural urban runoff pollutants combining to befoul surface waters. Before the Industrial Revolution necessitated the nuisance regime, humanity did little to prevent environmental degradation. The earliest regime centered on nuisance, which required not only proof of damage, but a link to some discernible defendant whose efforts already seriously harmed the environment and who could provide relief or address the problem.

Finding parties to take responsibility for storm water harm is difficult for courts. By its nature, nonpoint source damage is diffuse and all but impossible to attribute to any particular person or entity. Moreover, the court system's emphasis on protecting valuable land use at the expense of degradation of less valuable land made recovery difficult even in cases involving clear fault. Urban storm water runoff receives its pollutants from economically valuable activities such as construction and use of roads that courts will be unlikely to punish. Claims involving individually small trickles of pollution will likely not produce sufficient money damages to be worth raising in courts. Regardless of shifting attitudes that led to the environmental boom of the 1970s, the courts with their nuisance precedents are unlikely to offer novel

208. Clean Water Act § 101(a), 33 U.S.C. § 1251(a) (2012).

solutions to a problem that legislative efforts such as the CWA declined to fully address.²⁰⁹ Even if the states had the political will to issue more stringent storm sewer standards than those being enforced under the CWA, federal courts cannot require states to adhere to higher standards than the federal statutes mandate.²¹⁰

Early environmental statutes failed to protect the nation's waterways. Before the 1970s, states were far more interested in industry and economic gain than in environmental protection. Cleveland's famously flammable Cuyahoga and other industrial rivers were sacrifices in the states' and local governments' efforts to protect business and the livelihood of businesspeople and the workers they employed.²¹¹ Relatively invisible nonpoint source pollution is unlikely to elicit the type of public demand for action that dramatic pictures of flaming rivers did.

Public-private partnerships can incentivize industries and farms to reduce their impact on waterways through clean-water label designations. However, these are economically motivated and not devoted to environmental improvement despite expense. Plus, the well-established Energy Star resonates as environmentally friendly and economically frugal, but upstart labels claiming that the industry contributed to a possibly invisible reduction in diffuse pollution likely will have less immediate impact. Clean-water labels do not carry the same promise of reductions in utility bills, unless a costly outreach campaign can inform the public that a decreased need to treat water for urban runoff is financially beneficial. Also, the labels risk accusations of greenwashing, as any given industry is unlikely to have a noticeable impact alone on the cumulative effects of diffuse, city-surface contamination. Competition with other labels also increases the risk of information overload, as consumers get inundated with more labels than they can process, leading to arbitrary decisions.²¹²

The CWA simply failed to address the nonpoint source problem at the federal level, providing only economic support to states to find solutions. It offered no concrete mandates on how states should control the pollution and left them vulnerable to the same "race to the bottom" that permitted pre-1970s industrial discharge problems. Tight oversight by defined regulatory authorities, as well as certainty in requirements for monitoring and

209. *See id.* § 1329 (2018) (declining to set federal standards but merely to offer states assistance in addressing nonpoint source pollution).

210. *City of Milwaukee v. Illinois*, 451 U.S. 304, 319–20 (1981).

211. *See* Latson, *supra* note 106 ("Omaha's meatpackers fill the Missouri River with animal grease balls as big as oranges." (quoting *America's Sewage System and the Price of Optimism*, TIME (Aug. 1, 1969), <http://content.time.com/time/subscriber/article/0,33009,901182-1,00.html>)).

212. Bradshaw Schulz, *supra* note 204, at 763.

mitigation, made point source regulation successful. Nonpoint source strategy, by contrast, involves uncertainty about the authority behind mandates, with no clear guidance. The planned elimination of federal aid for nonpoint pollution will likely reduce states' interest in improving the situation. Federal funds' absence would increase pressure on state and local taxpayers.

B. Federal Drawdown Increases Difficulty for State and Local Efforts

More than just federal water quality will likely decline along with funding for the EPA. Its 2018 budget plan declares: "States and tribes intimately understand their water quality problems and are therefore best positioned to develop localized solutions to protect their waters."²¹³ However, states have received millions of dollars in past years to fight nonpoint source pollution, and now will be responsible for funding entirely. State political leaders will likely emphasize economic benefits such as favorable tax policy rather than tie themselves to low-visibility environmental cleanup from which the federal government already withdrew. They will be unlikely to support raising state taxes to make up for the federal shortfall, meaning studies of nonpoint pollutants will likely see less funding.

The EPA is largely isolated politically and economically, enabling it to handle the task of environmental regulation,²¹⁴ which is a long-term, far-sighted process. It may appear to lack immediate, short-term results or economic benefits necessary to win popular political support. The president oversees administrative agencies and must navigate the political trade winds to shore up support for re-election campaigns or to promote a favorable electoral climate for a successor. Nonetheless, the inner workings of the EPA rarely emerge as a hot-button political talking point in presidential campaigns. While the level of support has tracked the changing of ruling parties in the executive branch,²¹⁵ an empowered EPA can make the short-term economic sacrifices necessary for long-term environmental sustainability, which can benefit the environment, recreation, and the future sustainability of the urban desert environment.

The drawdown in funding could harm Phoenix economically as well as environmentally. A looming shortage as the levels of Lake Mead descend

213. EPA 2018, *supra* note 11, at 15.

214. See Anne Joseph O'Connell, *Bureaucracy at the Boundary*, 162 U. PA. L. REV. 841, 879–80 (2014) (highlighting tensions between directly elected presidents and Congress in associating too closely with administrative state, illustrating uncertainty in political control of agencies).

215. See *EPA's Budget and Spending*, *supra* note 176.

further could prompt water conservation efforts that could increase consumer water costs, savings might become more noticeable. Locally driven efforts have expanded Phoenix's use of green infrastructure. However, the EPA supported those efforts, so the financial future of those projects may become uncertain. Many large plots of impervious pavement are not easily mitigated without significant financial incentive, so the political will to cut back on unnecessary road width will likely lie dormant. Moreover, many organizations pushing for environmental improvements are still tied to profit motives and might lack the capacity to absorb short-term costs for long-term benefits the way the politically and economically isolated EPA can.

One might argue that giving states full responsibility for nonpoint source pollution will not provoke a race to the bottom, and instead create a race to the top. States have a strong incentive to provide clean water to residents and businesses, and those businesses could benefit by using cleaner resources. Favorable environmental images can draw residents to increase populations and tax bases, resulting in more state funds for monitoring and runoff mitigation. However, nonpoint source pollution lacks dramatic visibility of the kind that provoked the tight point source controls of the 1970s—flaming rivers. Its diffuse nature and lack of clear villains also decrease the likelihood of public outcries. Despite risks to health and the environment, people and businesses are not likely to be significantly moved by nonpoint source mitigation.

Full state responsibility will also increase political pressure to degrade the environment. The need to use tax money to mitigate polluted urban storm runoff will likely have much greater visibility to residents and businesses interested in favorable economic conditions. State regulatory agencies are tied more closely to elected governmental entities such as governors or legislatures. Voter patience with short-term economic pain for long-term environmental and economic gain will likely be too short for benefits of environmental stewardship to surface. Many voters facing pressure to sustain themselves demand economic security even at the price of some environmental health. The present regulatory climate appears poised to maintain the polluting status quo or worse.

C. Solution: Local Strategies with Federal Support and Guidance

The Clean Air Act provides a model for cleaning up nonpoint source pollution because it concerns a similar resource. It mandates limits in emissions of particular pollutants. Air, like water, is a common resource that receives pollution from a variety of sources that are difficult to trace. Regulators identified six out of the many substances dissolved into the air to

be controlled, perhaps limiting its scope to make cleaning the air of its worst pollutants feasible. Similarly, water incorporates a variety of substances that may be unpleasant, noxious, or harmful. The current regimes give deference to states to sort out how they will clean storm water runoff. States likely have identified the main problem pollutants. But a scattered approach to enforcement has only produced impaired waterways and, as evidenced by the proposed spending cuts, an apparently waning political will to continue the efforts. By contrast, clearly identifying problematic substances and setting enforceable mandates to reduce category pollutants would be a more effective strategy, concentrating resources on beneficial efforts that can produce concrete results.

The Clean Air Act's cooperative structure, in which states decide how they will meet federal benchmarks, also provides an attractive model for a new approach to nonpoint source pollution. Rigid mandates from Washington, D.C., may not present optimal solutions to far-flung places like Arizona. The state is distinct in many ways, including but not limited to culture, climate, economics and, water sensitivity. Agencies in the federal government are isolated enough to withstand the economic pressure to implement rigid policies that will preserve environmental health. That can help counter the tendency to accept harm to water to achieve the economic benefits that some activities create. Adding the CWA's citizen suit provision, in fact, can create financial incentive for people who otherwise could not effectively address lead in their drinking water to demand environmental justice.

Local people and local governments are likely best suited to find the optimal solutions. A nationwide mandate for particular water policies may not match the needs of different regions that have unique needs and situations. For example, rainy Seattle might face significantly more burdens than arid Phoenix if a federal policy required all states to reduce the frequency and duration of storm water pollution deposits. Moreover, local people could determine an optimal mix of strategies that would spread burdens among different stakeholders. For example, policies could require relatively minor cleanup mandates for residents and motorists to reduce pressure on construction companies to limit dust and soil pollution. States and locals with knowledge of the area could provide solutions particular effectiveness, such as dedicating resources to reducing Phoenix's impervious pavement, which promotes dirty storm runoff. Furthermore, Phoenix could invest some part of its storm water cleanup resources to improving its storm sewer infrastructure. Both of those strategies might also reduce its flooding problems.

The Salt River could easily benefit from this approach. Arizona could incentivize reductions in lead and copper on roads and at construction sites, and possibly filter these heavy metals with an improved sewer system. The

state could decide to spread these burdens to other areas, replacing lead pipes and reducing the effects of old copper mines. The river is a key source of vital water in a desert city, and its health is important for Phoenix's long-term sustainability.

Limiting full responsibility from taxpayers to address urban storm water pollution to a relatively small number of identifiable, actually harmful substances can reduce likely voter opposition to expanded pollution efforts. Minimum standards in place to prevent a race to the bottom, in which states sacrifice some environmental health to improve economic competitiveness. The flexibility a federal-state partnership would give to states instead might produce a race to the top, in which different regions improve their environments to greater degrees. A competition for a healthier environment can benefit health and outdoor recreation to attract residents. Abundant clean resources can also improve the quality of products and businesses' images to attract more industry.

One could argue that the 1956 Water Pollution Control Act used a federal-state approach, but water commonly remained severely polluted before the Environmental Decade of the 1970s. The present situation is different. Point source pollution, which was the main problem in the 1950s, has been significantly reduced, so focused efforts to reduce categorized pollutants would likely have more success without pervasive dumping hampering progress. Surgical efforts to target individual pollutants with mitigation efforts before redepositing into surface water or aquifers can yield environmental benefits without the high cost of purification at treatment plants. Tension between the need to recharge aquifers and the need to satisfy surface water rights would arise. Any storm water detained for filtration through the soil to recharge aquifers would no longer flow unfiltered to streams to satisfy surface water appropriators. However, under a federal-local partnership, local experts can optimize the allocation to meet economic and environmental needs.

IV. CONCLUSION

No effective nonpoint source pollution scheme has yet emerged, and the federal government's drawdown of environmental support suggests that urban storm water runoff will continue polluting nearby waterways, such as Phoenix's Salt River. However, environmental remediation can produce health and economic benefits, and need not be curtailed for the sake of the economy. Despite its lower public visibility, nonpoint source pollution such as storm water runoff still poses health and sustainability risks. The federal government should maintain its lead in environmental enforcement and

expand its reach in the under-addressed nonpoint source pollution problem. It can guide states to produce economically efficient controls of specified harmful pollutants, such as E. coli bacteria, lead, and copper. States and local governments are better situated to implement locally optimal solutions. In Arizona, Phoenix should implement further green infrastructure and porous surfaces to retain storm water and let it soak into the pollutant-filtering earth. It can use an optimal mix of storm water and pollution control efforts, such as reducing hazardous spills and improving flood-control infrastructure, to improve the health of Arizona's water in an economically beneficial way.