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The Evolution of Municipal Water Service: From Providers to Comprehensive Water Managers

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THE EVOLUTION OF MUNICIPAL WATER SERVICE: FROM PROVIDERS TO COMPREHENSIVE WATER MANAGERS

*Dan Tarlock**

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**INTRODUCTION: FROM A DUTY TO SERVE TO A DUTY OF URBAN
WATER STEWARDSHIP**

Over 85% of water demand in the United States is provided by local water agencies.¹ Of the water withdrawn for public supply, 61% comes from surface withdrawals and most of the rest from groundwater.² Total municipal withdrawals constitute only 14% of total United States withdrawals, a small figure compared to the 70% of global average withdrawals for agriculture.³ Local governments have long had a duty to secure and distribute adequate, safe supplies to residents within their service areas.⁴ Today, however, suppliers face four interrelated challenges in meeting this duty: (1) aging infrastructure, (2) contaminated supplies, (3) threats to existing and new supplies created by global climate destruction (GCD)⁵ and competing demands, and (4) increased inland flooding.⁶ A combination of GCD, competing demands for water resources, and contaminated water supplies makes finding adequate drinking water supplies a nation-wide problem.⁷ However, local governments must address these

1. See Water Resources Mission Area, *Public Supply Water Use*, U.S. GEOLOGICAL SURV. (Mar. 1, 2019), <https://www.usgs.gov/missionareas/water-resources/science/public-supply-water-use> [<https://perma.cc/RMM5-BRXB>] (“An estimated 283 million people relied on public-supply water for their household use in 2015. This number represents about 87 percent of the total U.S. population.”).

2. See *id.*

3. See *id.*; *Water in Agriculture*, WORLD BANK, <https://www.worldbank.org/en/topic/water-in-agriculture> [<https://perma.cc/WJF8-542U>] (last updated Oct. 5, 2022).

4. See Jim Rossi, *The Common Law “Duty to Serve” and Protection of Consumers in an Age of Competitive Retail Public Utility Restructuring*, 51 VAND. L. REV. 1233, 1250–51 (1998).

5. I prefer the term “global climate disruption” (GCD) first used by John Holdren, a Harvard University Professor of Environmental Policy, in 2007 and again when he served as President Barack Obama’s Science Advisor. See, e.g., John P. Holdren, *Global Climate Disruption: What Do We Know? What Should We Do?*, Presentation at The Forum, John F. Kennedy School of Government, Harv. Univ. (Nov. 6, 2007), [https://www.belfercenter.org/sites/default/files/legacy/files/uploads/2007_11-6_Forum_\(NXPowerLite\).pdf](https://www.belfercenter.org/sites/default/files/legacy/files/uploads/2007_11-6_Forum_(NXPowerLite).pdf) [<https://perma.cc/WCA3-8S6L>]. The term has not yet displaced “climate change,” but it is a more accurate descriptive of the changed climate-related stressors facing many urban areas. See *id.*; see also Jeff McMahon, *Forget Global Warming and Climate Change, Call It ‘Climate Disruption’*, FORBES (Mar. 12, 2015, 8:52 AM), <https://www.forbes.com/sites/jeffmcmahon/2015/03/12/forget-global-warming-and-climate-change-call-it-climate-disruption> [<https://perma.cc/F2UL-R82F>].

6. See David Sedlak, *How Development of America’s Water Infrastructure Has Lurched through History*, PEW (Mar. 3, 2019), <https://www.pewtrusts.org/en/trend/archive/spring-2019/how-development-of-americas-water-infrastructure-has-lurched-through-history> [<https://perma.cc/49HM-5PRV>]. This is a world-wide problem. See, e.g., Chunyang He et al., *Future Global Urban Water Scarcity and Potential Solutions*, 12 NATURE COMM’NS, no. 4667, 2021, at 1, 2.

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

problems with limited help from federal or state governments while simultaneously being forced to adapt to the full range of issues presented by GCD, competing demands for available supplies, and pressures to make urban areas more sustainable. Diminished supplies from GCD constitute a major problem in the West, but this issue is not restricted to the West.⁸ Climate destruction will threaten supplies in humid as well as arid areas.⁹ For example, rising sea levels threaten drinking water supplies along the Atlantic coast of the United States as groundwater pumping leads to saltwater intrusion, meaning saltwater is invading freshwater aquifers.¹⁰ The net result is that urban water suppliers are being forced to take a more active role in water management not only within, but also outside their service areas.¹¹

The primary legal regimes regulating urban water providers are public utility law, state water rights law, and federal and state water pollution law. Local governmental providers, primarily municipalities and special districts, are generally not classified as public utilities, but instead they are generally regulated by local entities.¹² For example, only six states regulate public water system rates.¹³ Regardless of the legal structure, local water providers are subject to the primary service duties that public utility law imposes on regulated monopolies.¹⁴ Consumers within the service area are entitled to reliable service at reasonable rates.¹⁵

8. See Sarah Hubbart & Nick Bradford, *The Increasing Demand and Decreasing Supply of Water*, NAT'L ENV'T EDUC. FOUND., <https://www.neefusa.org/story/water/increasing-demand-and-decreasing-supply-water> [<https://perma.cc/BA4V-NRM2>] (last visited Aug. 11, 2023).

9. Climate destruction is projected to increase municipal water withdrawals in almost all states. Only Kentucky, large parts of Michigan and West Virginia are likely to see no increase. *See id.*

10. VA. ACAD. SCI., ENG'G, & MED., *THE IMPACT OF CLIMATE CHANGE ON VIRGINIA'S COASTAL AREAS* 1, 34 (2021), https://www.vasem.org/assets/docs/VASEM_VirginiasCoastalAreasReport_FINAL.pdf [<https://perma.cc/3U57-D3UD>].

11. *See, e.g.*, Jon Hurdle, *Creeping Salt Water Forces Cape May City to Consider More Desalination*, NJ SPOTLIGHT (July 30, 2020), <https://www.njspotlightnews.org/2020/07/creeping-salt-water-forces-cape-may-city-to-consider-more-desalination/> [<https://perma.cc/335D-NAFV>].

12. *See* Xinyu Zhang et al., *Water Pricing and Affordability in the US: Public vs. Private Ownership*, 24 WATER POL'Y 500, 502 (2022).

13. *See id.* at 505–06.

14. *See Rossi, supra* note 4, at 1244, 1250, 1257.

15. The duty originated at common law, *see Rossi, supra* note 4, at 1236, and is generally incorporated into state public utility acts, for example, WASH. REV. CODE § 80.28.010 (2022).

The duty to provide safe drinking water was completely federalized with the 1986 amendments to the 1974 Safe Drinking Water Act.¹⁶ Flood protection shifted from a local responsibility to a shared state and local one in the nineteenth century, and to a primarily federal one in the early twentieth century.¹⁷ In fact, during that time, the federal government built multipurpose reservoirs upstream from many cities.¹⁸ However, the federal government is no longer building large dams and is funding fewer local projects.¹⁹ Thus, more recently, general water management responsibility is devolving downward.²⁰ One example of a local, sustainable response to this devolution is the “Sponge City” movement, which promotes more absorbent streets and greener infrastructure.²¹ In this landscape, local governments are increasingly combining flood water management with water supply augmentation to provide adequate water supplies to their residents.

This Essay focuses on the challenges that local governments face in providing adequate water supplies for their residents in the face of GCD and competing demands for limited supplies. It does not explicitly deal with sea level rise adaptation, nor does it discuss the problems of replacing aging infrastructure, inland flood management, and providing safe drinking water for all residents. This Essay draws on the rich accounts of how individual urban areas secured adequate water supplies in the face of urban growth.²² It argues that urban adaptation to climate destruction, competing demands for water, and the reconnection of cities to their water sheds of origin is forcing cities to become urban water stewards as well as water providers.

Urban water stewardship calls for a new relationship between urban areas and the water sheds that supply their water demands. It reflects the evolution of urban water management or control to a broader and more nuanced,

16. See generally Safe Drinking Water Act Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642 (codified as amended at 42 U.S.C. §§ 300f–j-27).

17. See JOSEPH L. ARNOLD, *THE EVOLUTION OF THE 1936 FEDERAL FLOOD CONTROL ACT* 3–4 (1988).

18. See JOHN R. FERRELL, *BIG DAM ERA* 4, 16 (1993).

19. See Debbie M. Chizewer & A. Dan Tarlock, *New Challenges for Urban Areas Facing Flood Risks*, 40 *FORDHAM URB. L.J.* 1739, 1747 (2013).

20. See *id.*

21. The term “Sponge City” has emerged to describe intensive efforts by cities to absorb more water from increased rainfall, but the idea remains mainly a theory with the exception of cities in Asia and Europe. See Ali Hamidi et al., *Sponge City — An Emerging Concept in Sustainable Water Resource: A Scientometric Analysis*, 5 *RES., ENV'T & SUSTAINABILITY* 1, 1 (2021). Copenhagen, Denmark is one of the first major cities to adopt this flood control strategy. See MILJØ METROPOLEN, *COPENHAGEN CLIMATE ADAPTATION PLAN* 26, 58 (2011), https://en.klimatilpasning.dk/media/568851/copenhagen_adaption_plan.pdf [<https://perma.cc/NXD6-WEH8>].

22. For an excellent history of the provision of clean water to cities starting with the Roman aqueducts with a primary focus on the United States, see generally JAMES SALZMAN, *DRINKING WATER: A HISTORY* 53–69 (1st ed. 2013).

scientific, and ethical view of the water landscape that includes both areas of origin and use. It also reflects the legal and political pressures that urban water suppliers face stemming from climate destruction, including to address often-excluded interests such as the environment and social justice in water management. Such water stewardship may be achieved through a stakeholder-inclusive process that recognizes collective challenges in the face of water scarcity and acknowledges the importance of “taking care of something that we do not own.”²³ Ultimately, stewardship requires more attention to how water is shared among different communities, natural and human, and “connects water governance to both place and scale.”²⁴

This Essay proceeds as follows: Part I sets out the advantages virtually unrestricted water access provided urban areas in the past; Part II examines the evolution of watershed of origin protection duties, the emergence of more stringent water conservation measures that limit individual choice, and the linkage of water service and land use planning; and Part III briefly speculates about the possible legal implications of stewardship going forward, and its increasing relevance today.

I. THE GOOD OLD DAYS: GEOGRAPHY AND LAW ONCE MADE SERVICE PROVISION EASY

As urban areas began to grow in the nineteenth century, they outgrew their local water supplies.²⁵ Cities such as New York and Philadelphia went to distant watersheds or rivers when faced with shortages.²⁶ New York City’s search for water supplies beyond the city began in 1799, and the city ultimately became the manager of parts of three watersheds.²⁷ Other cities followed suit. In the West, Seattle emulated New York and acquired watershed land in the Cascade Mountain.²⁸ Meanwhile, Los Angeles and San Francisco were also forced to tap into distant watersheds.²⁹

23. *About the Alliance for Water Stewardship*, ALL. FOR WATER STEWARDSHIP, <https://a4ws.org/about/> [https://perma.cc/D3TQ-HZTP] (last visited Aug. 14, 2023).

24. David Groenfeldt & Jeremy J. Schmidt, *Ethics and Water Governance*, 18 *ECOLOGY & SOC’Y* 1, 4 Mar. 2013), <https://ecologyandsociety.org/vol18/iss1/art14/ES-2011-4629.pdf> [https://perma.cc/WA7A-XHF9].

25. See SALZMAN, *supra* note 22, at 61–63.

26. See *id.* at 62, 68.

27. See *History of New York City Drinking Water*, N.Y. CITY DEP’T ENV’T PROT., <https://www.nyc.gov/site/dep/water/history-of-new-york-citys-drinking-water.page> [https://perma.cc/US6H-2WK6]; SALZMAN, *supra* note 22, at 68–69.

28. Cedar River Watershed, CITY OF SEATTLE, <https://www.seattle.gov/utilities/protecting-our-environment/our-water-sources/cedar-river-watershed> [https://perma.cc/3RGX-AG6K] (last visited Sept. 5, 2023).

29. See, e.g., WILLIAM L. KAHRL, *WATER AND POWER: THE CONFLICT OVER LOS ANGELES’ WATER SUPPLY IN THE OWENS VALLEY* (1982); Gregory J. Reis et al., *Clarifying*

Traditionally, water management has functioned at the state level.³⁰ In fact, states define water rights.³¹ There are three basic systems in the United States; the common law of riparian rights, the doctrine of prior appropriation, and regulated riparianism.³² The common law of riparian rights was designed for a mill economy, and the doctrine of prior appropriation was designed for an irrigation economy.³³ Because they were not designed for an urban economy, both doctrines contained possible barriers to acquiring rights for urban uses, but courts and legislatures removed them when faced with the reality of water scarcity.³⁴

Riparian rights are correlative based on the ownership of land along a stream.³⁵ Each user's use must be reasonable, and reasonableness is, in part, a function of the impact on other riparians.³⁶ But, if no other riparian objects, the right holder can withdraw unlimited amounts.³⁷ Additionally, in contrast to prior appropriation, a riparian right can be asserted at any time, possibly displacing earlier uses.³⁸ The common law also contained one potentially favorable doctrine for cities, a preference for domestic use.³⁹ However, almost all courts refused to allow urban water suppliers to take advantage of this preference by limiting it to individual subsistence use.⁴⁰

The biggest potential barrier the common law of riparian rights initially posed was the watershed rule, which limited water use to riparian owners in the watershed of origin.⁴¹ But, when faced with objections to cities tapping water outside their watersheds, courts began to relax the watershed restriction by requiring a show of actual damages.⁴² Ultimately, the power of eminent domain resolved most objections from competing riparians.⁴³

Effects of Environmental Protections on Freshwater Flows to — and Water Exports from — the San Francisco Bay Estuary, SAN FRANCISCO ESTUARY & WATERSHED (Mar. 2019).

30. See A. DAN TARLOCK & JASON ANTHONY ROBISON, LAW OF WATER RIGHTS AND RESOURCES § 1:1 (2023).

31. See *id.*

32. See *id.* §§ 3:5, 3:90, 5:3.

33. See *id.* §§ 3:5, 5:3.

34. See *id.* § 3:59.

35. See *id.* § 3:5.

36. See *id.* § 3:60.

37. See *id.*

38. See *id.* § 3:52.

39. See *id.* § 3:59.

40. See *id.*

41. See *id.* § 3:51.

42. See *Stratton v. Mt. Hermon Boys' School*, 103 N.E. 87, 88 (Mass. 1913) (refusing to enjoin a trans-watershed diversion but allowed the recovery of actual damages). Municipal water providers always have the option of paying damages or condemning the riparian rights of injured landowners. See Robert H. Abrams & Noah D. Hall, *Framing Water Policy in a Carbon Affected and Carbon Constrained Environment*, 50 NAT. RES. J. 3, 21–23, 69 (2010).

43. See TARLOCK & ROBISON, *supra* note 30, § 3:59 n.1.

Furthermore, the Supreme Court refused to apply the rule when Boston and New York tapped interstate rivers to supply water to their residents.⁴⁴

Over time, these rules functionally created a super-preference for urban use.⁴⁵ This preference allowed urban areas to go to distant watersheds, acquire the water that they needed either through buying land and the attached riparian rights, or by appropriating the so-called unused water, thus disregarding the impacts of these diversions such as social disruption or environmental damage in the watershed of origin.⁴⁶

The story is the same for the groundwater on which many cities rely. Courts initially followed the absolute ownership doctrine which allowed any landowner, including cities, to pump unlimited amounts of water.⁴⁷ Today, almost all courts have abandoned the absolute ownership doctrine in favor of a rule of reasonableness.⁴⁸ In theory, the doctrine limits use to overlying landowners, an analogous doctrine to the watershed rule in riparian rights.⁴⁹ In practice, the reasonable use doctrine allowed cities to pump groundwater from nearby aquifers.⁵⁰ In the case of adjoining landowners, mainly farmers, courts balanced the equities, refused to grant landowners an injunction, and allowed cities to pay damages.⁵¹

In the West, cities were able to take advantage of the law of prior appropriation, which allowed the use of water outside the watershed of origin.⁵² Western cities faced a more serious restriction, but once again the law quickly removed it. Prior appropriation has a strong anti-monopoly strain developed to share water among irrigators; water must be put to beneficial use within a reasonable period of time of claiming an appropriative water right.⁵³ This anti-speculative use doctrine could have

44. *See Connecticut v. Massachusetts*, 282 U.S. 660 (1931) (holding that Connecticut was not entitled to enjoin Massachusetts from diverting water from the watershed of the Connecticut River); *New Jersey v. New York*, 283 U.S. 336 (1931) (denying an injunction requested by New Jersey to restrain New York from diverting the Delaware River to the New York City water supply in the amount of 440 million gallons per day).

45. For a more detailed discussion of this argument see A. Dan Tarlock, *We Are All Water Lawyers Now: Water Law's Potential but Limited Impact on Urban Growth Management*, in *WET GROWTH: SHOULD WATER LAW CONTROL LAND USE?* 57, 59 (Craig Anthony Arnold ed., 2005).

46. *See id.*; *supra* notes 27–29 and accompanying text.

47. *See* TARLOCK & ROBISON, *supra* note 30, § 4:6.

48. *See id.* § 4:7.

49. *See id.* § 4:9.

50. *See id.* § 4:10.

51. *See id.*

52. *See, e.g., Coffin v. Left Hand Ditch Co.*, 6 Colo. 443, 449 (1882) (holding “[i]mperative necessity” required that water be transported long distances to support an irrigation economy).

53. *See* DAVID SCHORR, *THE COLORADO DOCTRINE: WATER RIGHTS, CORPORATIONS, AND DISTRIBUTIVE JUSTICE ON THE AMERICAN FRONTIER* 47 (2012).

constrained growing cities from obtaining water supplies to support future growth. To promote growth, the judiciary created the great and growing cities doctrine, at the urging of cities.⁵⁴ This freed cities from the anti-speculation doctrine and allowed them to acquire water rights in advance of growth.⁵⁵ Meanwhile, rapid urban growth provided the tax base to build the necessary storage and distribution facilities to supply water to urban residents.⁵⁶

II. THE NEW URBAN WATER WORLD: A ROAD TO WATER STEWARDSHIP?

Cities remain a “super” priority when they need to obtain the necessary water supplies, but they are now facing two inter-related challenges. The first is climate destruction. Increasingly, local governments face dealing with the whipsaw of increasing periods of too much or too little water.⁵⁷ For example, between 2022 and 2023, California experienced high rainfall, snowfall, and flooding.⁵⁸ But the high snow and rainfall produced limited drought relief, especially for communities that depend on groundwater.⁵⁹ Thus, local governments have become the first responders to address the adverse impacts of climate destruction and must aim to become more climate resilient going forward,⁶⁰ particularly in the face of the international community’s failure to develop an effective de-carbonization strategy to reduce greenhouse gas emissions.⁶¹ Therefore, the only strategy available is

54. See *City & Cnty. of Denver v. Sheriff*, 96 P.2d 836, 844 (Colo. 1939).

55. See *id.*

56. See, e.g., A. Dan Tarlock & Sarah B. Van de Wetering, *Growth Management & Western Water Law: From Urban Oases to Archipelagos*, 14 HASTINGS ENV’T L.L.J. 983, 1013 (2008).

57. See, e.g., Alastair Bland, *Is California’s Drought Over? Here’s What You Need to Know About Rain, Snow, Reservoirs and Drought*, CAL MATTERS (Jan. 12, 2023), <https://calmatters.org/environment/2023/01/california-drought-snow-rain/> [<https://perma.cc/N2FJ-6CHX>].

58. See *id.*

59. See *id.* In addition, it is now harder to capture winter snowfall, as experts have long predicted and California is experiencing, as high temperatures mean earlier melting which cannot be fully captured and stored. See *id.*

60. See generally R. Marie Garcia et al., *Assessing Linkages to Climate Change in Western States’ Water Plans*, in WORLD ENVIRONMENTAL AND WATER RESOURCES CONGRESS 2023 (2023).

61. See U.N. ENV’T PROGRAMME, EMISSIONS GAP REPORT 2022: THE CLOSING WINDOW – CLIMATE CRISIS CALLS FOR RADICAL TRANSFORMATION OF SOCIETIES xvi (2022), <https://www.unep.org/resources/emissions-gap-report-2022> [<https://perma.cc/4GVY-Y4LV>] (“Since the twenty-sixth United Nations Climate Change Conference of the Parties (COP 26), there has been very limited progress in reducing the immense emissions gap for 2030, the gap between the emissions reductions promised and the emissions reductions needed to achieve the temperature goal of the Paris Agreement.”).

to adapt to a warming climate by trying to temper the adverse impacts of a warmer, non-stationary climate.⁶² The U.S. federal government and most states have no coherent adaptation strategy.⁶³ In many cities, water is at the heart of adaptation. Western cities in arid regions face the greatest risk of diminished supply, but eastern cities also face such risks.⁶⁴ For example, Miami-Dade County relies heavily on groundwater, but its aquifers are vulnerable to saltwater intrusion, which is exacerbated by rising sea levels.⁶⁵

The second challenge is competing values. The two most important values are the environment and the impact of large-scale diversions on local communities in the watershed. Taking water out of rivers and lakes damages aquatic ecosystems.⁶⁶ Thus, municipalities have had to pay attention to the environmental impacts of their withdrawals in areas of origin.⁶⁷ This is especially true when listed endangered or threatened species are put at risk.⁶⁸ Large-scale diversions can disrupt local economies, impacts which have often been ignored in the past.

This Part explores examples of how municipalities have stepped into the position of water stewards in the face of water scarcity and climate destruction. Section II.A explores the rise of protecting environmental and social values in watersheds of origin, the areas from which water is transported for urban use. Section II.B demonstrates aggressive water conservation measures implemented by cities which require lifestyle management. Section II.C argues for the future integration of water service and land use planning to promote sustainability and urban water access going forward.

A. Watersheds of Origin Protections

Cities which transported water considerable distances have had two contrasting relationships with the watersheds of origin: stewardship or indifference. There is a common element to these stories. Initially, cities

62. *See id.* at xv (concluding that there is no credible pathway to achieving the 2016 Paris Conference goal of only a 1.5° C temperature rise above pre-industrial levels).

63. A recent survey of western state water plans concludes that “[w]ith the exception of California, Colorado, and Oregon that have mechanisms in place for implementing climate change adaptations, western state water plans acknowledge climate change, but many lack sufficient recognition of its potential impacts to their state water resources.” *See Garcia et al., supra* note 60, at 519.

64. *See id.*; *Saltwater Intrusion, MIA.-DADE CNTY.*, <https://www.miamidade.gov/global/water/conservation/saltwater-intrusion.page> [https://perma.cc/7R6D-Q9BN] (last visited Aug. 7, 2023).

65. *See id.*

66. *See generally e.g., Bland, supra* note 57.

67. *See id.*

68. *See id.*

were able to ignore the social concerns of those in the watershed of origin over loss of supply and the environmental and social implications of some such diversions.⁶⁹ Few cities, such as New York City and Seattle, have long been watershed managers, but most were not.⁷⁰ The environmental and social justice movements, broadly defined, and accompanying media attention have made it much more difficult for cities to ignore the concerns emanating from those living in the region of watersheds of origin for reasons ranging from self-interest, litigation, or legislative constraints.⁷¹ Today, cities must take a more active role in promoting land use and other practices in the area of origin that could adversely impact the quantity and quality of their supply.⁷² Legislation and litigation have been the primary drivers of modern stewardship initiatives.⁷³

1. Legislation Driven Initiatives: New York City, the Great Lakes and San Antonio

New York, the Great Lake Basin cities, and San Antonio each provide an example of a legislation-driven water stewardship initiative.⁷⁴ The New York City Watershed Program provides approximately 1.2 billion gallons of drinking water to almost half of the New York state population daily, including eight million residents of the City.⁷⁵

New York is now an active manager of the Catskill watershed and is an example of an evolving self-interest stewardship.⁷⁶ The driver is not altruism or concern for the environment. New York has long avoided building expensive treatment facilities that would disinfect its water supply. In fact, “[t]he New York City drinking water supply system is the largest unfiltered water supply in the United States.”⁷⁷

69. See, e.g., DAVID SOLL, *EMPIRE OF WATER: AN ENVIRONMENTAL AND POLITICAL HISTORY OF THE NEW YORK CITY WATER SUPPLY* 131 (2017).

70. See *id.*; Kit Oldham, *Seattle Residents Receive Cedar River Water for the First Time on January 10, 1901*, HISTORYLINK (Oct. 17, 2014), <https://www.historylink.org/file/10945> [<https://perma.cc/MUR9-MMRT>] (Seattle tapped the Cedar River between 1895 and 1901).

71. See *id.* at 132–34.

72. See *id.*

73. See *id.*

74. See generally *New York City Water Supply*, N.Y. STATE DEP’T ENV’T CONSERVATION, <https://www.dec.ny.gov/lands/25599.html> [<https://perma.cc/L8QV-HF7L>] (last visited Aug. 7, 2023); A. Dan Tarlock, *The International Joint Commission and Great Lakes Diversions: Indirectly Extending the Reach of the Boundary Waters Treaty*, 54 WAYNE L. REV. 1671 (2008); CHARLES R. PORTER JR., *SPANISH WATER, ANGLO WATER: EARLY DEVELOPMENT IN SAN ANTONIO* (2009).

75. See *New York City Water Supply*, *supra* note 74.

76. See SOLL, *supra* note 69, at 131–34.

77. *Id.*

This strategy was threatened by the enactment of the Safe Drinking Water Act Amendments of 1986 which imposed a much more stringent standard on drinking water systems.⁷⁸ Farm run-off and other sources of non-point source pollution could have required the construction of a billion-dollar treatment system. However, to safeguard the irreplaceable natural water source in the Catskills, in 1997, the U.S. Environmental Protection Agency and the City developed an innovative and comprehensive watershed protection plan.⁷⁹ Such a plan is embodied in the historic New York City Watershed Agreement (“MOA”), “to protect and to ensure that New Yorkers continue to enjoy high quality, affordable drinking water and to avoid the need for costly filtration.”⁸⁰ A 2020 National Academies of Sciences, Engineering, and Medicine study of the MOA’s implementation concluded that:

1997 MOA and Watershed Protection Program have largely succeeded in maintaining or enhancing water quality for the NYC water supply system and providing sustained investments to enhance the economic vitality of watershed communities. Active and evolving partnerships with the Catskill Watershed Corporation, Watershed Agricultural Council, and many other organizations and agencies show the potential — and tradeoffs — of balancing water quality protection with community vitality.⁸¹

The Great Lakes are an example of a legislative constraint. In 2008, the Great Lakes states negotiated an interstate compact that preferences uses that keep water in the Great Lakes region because the lakes, large as they are, are a fragile ecosystem vulnerable to climate change.⁸² The Compact makes it very difficult to export water from the Great Lakes.⁸³ Out-of-basin diversions are only allowed under very limited conditions, even for cities that lie just outside the basin.⁸⁴ Section 4.9(3) requires that before communities

78. See SOLL, *supra* note 69, at 133.

79. See *New York City Water Supply*, *supra* note 74.

80. *Id.*

81. NAT’L ACADS. SCI., ENG’G, & MED., REVIEW OF THE NEW YORK CITY WATERSHED PROTECTION PROGRAM 11 (The National Academies Press 2020).

82. See Tarlock, *supra* note 74, at 1672. See generally Great Lakes–St. Lawrence River Basin Water Resources Compact (Dec. 13, 2005), https://www.glscompactcouncil.org/media/nmzfv5jq/great_lakes-st_lawrence_river_basin_water_resources_compact.pdf [https://perma.cc/7ABK-WQQD] [hereinafter Great Lakes States Compact]. A 2000 report of the Canada-United States International Joint Commission played a role in justifying the Compact’s stringent diversion standards on climate destruction and ecosystem conservation. See generally Tarlock, *supra* note 74; see also A. Dan Tarlock, *The Great Lakes as an Environmental Heritage of Humankind: An International Law Perspective*, 40 U. MICH. J.L. REFORM 995 (2007).

83. See Tarlock, *supra* note 74, at 1672–73.

84. See *id.* at 1673.

which straddle the basin⁸⁵ can use Great Lakes water, they must demonstrate that:

[T]here is no reasonable water supply alternative within the basin in which the community is located, including conservation of existing water supplies[.] [C]aution shall be used in determining whether or not the Proposal meets the conditions for this Exception. This Exception should not be authorized unless it can be shown that it will not endanger the integrity of the Basin Ecosystem[.]⁸⁶

The exception is difficult to obtain because of the high standard and the necessity to obtain the consent of all eight Great Lakes states as well as input from Ontario and Quebec.⁸⁷ Waukesha, Wisconsin, a suburb of Milwaukee, is a rare example of success.⁸⁸

Meanwhile, San Antonio, Texas, the nation's seventh largest city, has a similar story to New York City with a different legal driver.⁸⁹ After San Antonio exhausted existing local supplies, the city began pumping from the Edwards Aquifer, a limestone karst aquifer that stretches over 13 Texas counties.⁹⁰ The aquifer is also home to eight species listed as endangered under the federal Endangered Species Act (ESA).⁹¹ In 1993, the Sierra Club secured a federal district court ruling that the ESA required minimum water levels in the aquifer.⁹² To balance urban growth and species protection, San Antonio and other cities opted for a land-based aquifer protection strategy.⁹³ The Texas legislature created the Edwards Aquifer Authority, charged with

85. In many states such as Illinois, Indiana, and Ohio, the Great Lakes watershed is a narrow band along the lake. Almost all of the Chicago metropolitan area is in the Mississippi, not Great Lakes, watershed. Thus, areas where a city is in the basin, although located only a short distance from the lake. The Great Lakes Compact carved out a special access exception to these "straddling" cities.

86. Great Lakes States Compact, *supra* note 82, §§ 4.9(3)(d)–(e).

87. *See* Tarlock, *supra* note 74, at 1676.

88. It has taken over a decade for Waukesha to obtain water from Milwaukee to replace well water which does not meet federal drinking water standards due to radium contamination. The diversion was approved by the eight Great Lakes Compact states in 2018, and in 2021 the Wisconsin Department of Natural Resources issued a diversion permit. *See DNR Issues Waukesha Diversion Approval, Implementing Great Lakes Compact Council Decision*, WIS. DEP'T NAT. RES. (June 30, 2021), <https://dnr.wisconsin.gov/newsroom/release/46156> [<https://perma.cc/4MPZ-6VNK>].

89. *See generally* PORTER JR., *supra* note 74.

90. *See generally id.*

91. *See generally* Robert L. Gulley & Todd H. Votteler, *Resolving ESA-Water Conflicts: The Edwards Aquifer Recovery Implementation Program*, in 58 WATER REPORT 1 (2008), <https://waterdisputes.org/wp-content/uploads/2018/01/water-solutions-todd-votteler.pdf> [<https://perma.cc/76NM-NHRS>].

92. *See* Todd H. Votteler, *The Little Fish that Roared: The Endangered Species Act, State Groundwater Law, and Private Property Rights Collide Over the Texas Edwards Aquifer*, 28 ENV'T L. 845, 856 (1998).

93. *See* Gulley & Votteler, *supra* note 91, at 4.

protecting the aquifer.⁹⁴ In brief, the Authority has acquired land over the aquifer to protect recharge areas, thus deflecting urban growth away from these areas.⁹⁵ However, researchers warn that there are still varying levels of threats to the survival of species in the area.⁹⁶ In 2018, The National Academies of Sciences, Engineering, and Medicine released a report on the effectiveness of the Habitat Conservation Plan, which rated the survival of the Fountain Darter likely and the Texas Blind Salamander somewhat likely.⁹⁷ San Antonio illustrates that managing a watershed to comply with federal endangered species mandates is an ongoing experiment.

2. *Litigation Induced Stewardship: Los Angeles and Las Vegas Denied Access to Distant Supplies*

Los Angeles and Las Vegas exemplify and illustrate two types of litigation-enforced stewardship.

i. Los Angeles: Litigation Leads to Taking Ownership of River Restoration

As Los Angeles began to grow in the late nineteenth century, it quickly exhausted its local river, the Los Angeles River, and concerns arose over groundwater extraction.⁹⁸ To support the explosive growth, the City of Los Angeles purchased most of the water rights of farmers in the Owens Valley and built an aqueduct to take the water to Los Angeles.⁹⁹

Los Angeles was eventually forced to deal with the environmental costs of imported water. After fully appropriating the Owens Valley, Los Angeles moved further north, and in 1940, obtained the water rights of four of the five streams which fed into Mono Lake.¹⁰⁰ As Los Angeles pulled the water from the lake, large calcium carbonate towers, called tufa towers, emerged

94. *See id.*

95. *See, e.g., id.* at 2–7.

96. *See generally* NAT'L ACADS. SCI., ENG'G, & MED., REVIEW OF EDWARD AQUIFER HABITAT CONSERVATION PLAN (2018); Thomas J. Devitt et al., *Species Delimitation in Endangered Groundwater Salamanders: Implications for Aquifer Management and Biodiversity Conservation*, 16 PROC. NAT'L ACAD. SCI. 29 (2019).

97. *See* NAT'L ACADS. SCI., ENG'G, & MED., *supra* note 96, at 69, 87, 93.

98. *See, e.g.,* KAHRL, *supra* note 29.

99. The dewatering of the Owens Valley was the first major interbasin transfer in the West and is immortalized in the 1974 movie, *Chinatown*. The history has been told many times. *See generally id.*; Abraham HOFFMAN, VISION OR VILLAINY: ORIGINS OF THE OWENS VALLEY-LOS ANGELES WATER CONTROVERSY (1981). For an unconvincing revisionist history see GARY D. LIBECAP, OWENS VALLEY REVISITED: A REASSESSMENT OF THE WEST'S FIRST GREAT WATER TRANSFER (2007).

100. *See* JOHN HART, STORM OVER MONO: THE MONO LAKE BATTLE AND THE CALIFORNIA WATER FUTURE 45–46 (1996).

from the floor of the lake, which was once part of an inland sea.¹⁰¹ The remote lake attracted visitors, and scientists that began to study the ecosystem quickly explained how the salinization of the lake would impact the large migratory bird population that stopped over the islands in the lake.¹⁰² A precedent-setting lawsuit applied California's public trust law, which had previously been almost exclusively limited to setting the standard for private use of submerged lands under navigable bodies of water, to require the state to protect private water rights.¹⁰³ Los Angeles suffered no loss of water as the state legislature appropriated money to find alternative water supplies.¹⁰⁴ But, the story does not end there. As part of an aggressive strategy to make Los Angeles more sustainable and climate-adaptive, the city implemented a long-term strategy to decrease its dependence on imported supplies.¹⁰⁵ This strategy involved expanding existing storage facilities to capture stormwater runoff.¹⁰⁶ The plan also explores the possibility of restoring the Los Angeles River to something approximating its pre-Spanish Conquest state.¹⁰⁷

ii. Las Vegas: An Example of Judicially-Imposed Social Justice Passive Stewardship

For most of the twentieth century, urban areas co-existed peacefully with agricultural areas, which claimed the lion's share of water in many states.¹⁰⁸ However, as the dam-building era began to wind down in the 1970s, urban areas were forced to view farms as the "new reservoirs."¹⁰⁹ Many western cities negotiated rural-to-urban water transfers.¹¹⁰ Put simply, because water is a commodity and water rights are transferable, the law has offered little

101. *See id.* at 20–21, 50–51.

102. *See id.* at 16–20.

103. *See Nat'l Audubon Soc'y v. Superior Ct. of California*, 658 P.2d 709, 712 (Cal. 1983), *cert. denied*, 464 U.S. 977 (1983).

104. *See* Craig Anthony Arnold, *Working Out an Environmental Ethic: Anniversary Lessons from Mono Lake*, 4 WYO. L. REV. 1, 21 (2004).

105. *See id.* at 24.

106. *See id.* at 25.

107. The project is still in the early planning stages and faces many obstacles. *See LA River Ecosystem Restoration*, CITY OF L.A.: L.A. RIVER REVITALIZATION BLOG (May 13, 2021), <https://lariver.org/blog/la-river-ecosystem-restoration> [<https://perma.cc/WUX8-HC3C>].

108. One of the most difficult problems of finding a balance between urban and agricultural users that depend on the shrinking Colorado River's average flows is that the vast majority of senior water rights in the basin are held by farmers. *See* Edward J. Sullivan & A. Dan Tarlock, *The Paradox of Change in the American West: Global Climate Destruction and the Reallocation of Urban Space and Priorities*, 37 J. ENV'T L. & LITIG. 23, 66–67 (2022).

109. *See id.* at 64.

110. *See generally* Jedidiah Brewer et al., *Transferring Water in the American West: 1987-2005*, 40 U. MICH. J. L. REFORM 1021, 1038 (2007).

redress to residents in the area of origin who no longer have unfettered access to water as they once did.¹¹¹ However, these rural areas have begun to fight back, as illustrated by the case of Las Vegas. Rural residents succeeded in blocking a rural-to-urban transfer and thus made Las Vegas a passive watershed steward.¹¹²

Las Vegas, Nevada relies heavily on its very small share of the Colorado River.¹¹³ In 1989, the predecessor to the Southern Nevada Water Authority proposed to pipe water from a remote valley on the Nevada-Utah border 300 miles to Las Vegas.¹¹⁴ This led to a prolonged fight between the Authority and its opponents, which included the Church of Jesus Christ of Latter-day Saints (Mormon), a large landowner in the area.¹¹⁵ Subsequently, in 2020, in a path-breaking opinion protecting third party interests, a Nevada district court ruled that the state's approval of a water right was arbitrary and capricious because it would mine the aquifer resulting in its depletion.¹¹⁶

The decision imposed no duties on the Southern Nevada Water Authority, but it helped spotlight the problem of the state's over drafted basins. Pumpers in groundwater basins are beginning to take innovative steps to limit pumping.¹¹⁷ In 2022, the Nevada Supreme Court interpreted 2011 amendments¹¹⁸ to the state's groundwater management act to impose cuts on senior pumpers that were necessary to move the basin toward safe yield, thus limiting withdrawals to replenishment.¹¹⁹ In short, no municipality in Nevada can consider filing for an appropriation in a managed basin without

111. The doctrine of prior appropriation allows other water right holders to challenge a transfer, see *Green v. Chaffee Ditch Co.*, 371 P.2d 775, 783 (Colo. 1962) (allowing a challenge to an application to divert water as the diversion injuriously affected other right holders), but offers limited protection to third parties impacted by the transfer, see COMM. ON W. WATER MGMT., NAT'L RSCH. COUNCIL, *WATER TRANSFERS IN THE WEST: EFFICIENCY, EQUITY, AND THE ENVIRONMENT* 71 (1992).

112. See *Decades-Long Campaign Forces Nevada Board to Kill Huge Las Vegas Groundwater Pipeline*, CTR. FOR BIOLOGICAL DIVERSITY (May 21, 2020), <https://biologicaldiversity.org/w/news/press-releases/decades-long-campaign-forces-nevada-board-kill-huge-las-vegas-groundwater-pipeline-2020-05-21/> [https://perma.cc/LAD7-8T9R].

113. See REED D. BENSON ET AL., *WATER RESOURCE MANAGEMENT* 361 (8th ed. 2020).

114. See *id.* at 356.

115. See *id.*

116. See *White Pine County v. Wilson*, No. CV-1204049, at 33 (Seventh Jud. Dist. Ct. Nev. Mar. 9, 2020), reprinted in BENSON ET AL., *supra* note 113, at 356. In May 2020, the Southern Nevada Water Authority voted to terminate the project. See *Decades-Long Campaign*, *supra* note 112.

117. See, e.g., *Diamond Nat. Res. Prot. & Conservation Ass'n v. Diamond Valley Ranch, LLC*, 511 P.3d 1003, 1005 (Nev. 2022).

118. See NEV. REV. STAT. §§ 534.037, 534.110 (2011).

119. *Diamond Nat. Res. Prot. & Conservation Ass'n*, 511 P.3d at 1012.

considering what it might be required to do to mitigate the adverse impacts of pumping.

These selected examples illustrate that there are many varieties of watershed stewardship which involve active and passive land management. The next two sections explore two other emerging aspects of watershed stewardship: limitations on individual water use and location choice.

B. Aggressive Water Conservation Measures & Lifestyle Management

Historically, municipal water consumers have been able to use water freely as long as they could pay for it.¹²⁰ Further, they could assume that they were drinking treated water from “natural sources.”¹²¹ Consumers could take long showers, build lush gardens, water them in the heat of the summer, fill swimming pools, and wash their cars as often as they chose.¹²² Rarely did cities impose on these choices. Until recently, consumers were not forced to accept a mix of fresh treated wastewater as distinguished from untreated pollutants.¹²³ The most controversial counterexample is the fluoridation of water beginning in the 1940s. Courts rejected numerous challenges,¹²⁴ although challenges continue as the evidence on the dental health benefits has weakened.¹²⁵ Today, cities are increasingly limiting lifestyle choices by curtailing the use and expectations of natural water.¹²⁶ There is an ongoing debate over the optimal mix of carrots and sticks to

120. These choices were encouraged by urban water pricing. Well into the 1990s, almost all urban water suppliers priced water either by charging a flat volumetric fee or through declining block rates which decreased the more water was used. Suppliers are now moving, despite consumer opposition, to increasing block rate pricing. *See generally* Momi Dahan & Udi Nasan, *Unintended Consequences of Increasing Block Tariffs Pricing Policy in Urban Water*, 43 WATER RES. RSCH. 1 (2007).

121. *Id.*

122. *Id.*

123. The Orange County Water District in southern California began distributing mixed treated sewage water with “natural” water in the mid-1970s as its limited surface supplies combined with saltwater intrusion into its aquifers. More recently, cities all over the world are embracing recycled waste water as the stresses mount. *See* Cecilia Tortajada, *Contributions of Recycled Wastewater to Clean Water and Sanitation Sustainable Development Goals*, NATURE PARTNER J. CLEAN WATER, Apr. 2020, at 3.

124. *See* Douglas A. Balog, *Fluoridation of Public Water Systems: Valid Exercise of State Police Power or Constitutional Violation*, 14 PACE ENV'T L. REV. 645, 665 (1997).

125. *See, e.g.*, *Food & Water Watch Inc. v. U.S. Env't Prot. Agency*, No. 17-CV-02162-EMC, 2022 WL 16528140 at *1 (N.D. Cal. Oct. 28, 2022).

126. *See, e.g.*, Sullivan & Tarlock, *supra* note 108, at 69–70 (describing standards implemented for low flush toilets, shower heads, and lawn maintenance).

encourage water conservation, but cities are using both as part of a broader push toward sustainability.¹²⁷ Two water examples suffice.

An iconic symbol of the good life in America, the lawn,¹²⁸ is under stress and urban areas are taking steps to curtail them. Curtailment is more prominent in arid areas, where lawns are subject to increasing regulation amidst growing incentives to tear them up.¹²⁹ The lawn is a European import first made popular by Thomas Jefferson and George Washington, and after the Civil War, it emerged as a status symbol in the East and Midwest.¹³⁰ Places such as Arizona and California attracted large numbers of Midwesterners, and they brought the lawn and garden culture with them.¹³¹ As drought has worsened, especially in the Colorado Basin, xeriscaping has emerged as an alternative to lawns.¹³² Instead of grass, yards are landscaped with drought-resistant native plants.¹³³ Homeowner associations (HOAs) in common interest communities have often objected to xeriscaping, but recently a Maryland couple who was ordered to remove their native plant landscape triggered a successful legislative effort to prohibit associations

127. Taking natural gas as an example, beginning with Berkeley, California's 2019 ban on natural gas hookups in new construction, over 100 cities have banned the use of natural gas in new construction. The first legal challenge to the federal Energy Policy Conservation Act held that there was no federal preemption because the Berkeley Ordinance "does not directly regulate either the energy use or energy efficiency of covered appliances." *California Rest. Ass'n v. City of Berkeley*, 547 F. Supp. 3d 878, 891 (N.D. Cal. 2021), *rev'd and remanded*, 65 F.4th 1045 (9th Cir. 2023). But the Ninth Circuit reversed holding that it had attempted to regulate the use of gas power powered appliances preempted by the federal act. *See California Rest. Ass'n v. City of Berkeley*, 65 F.4th 1045, 1056 (9th Cir. 2023).

128. *See generally* VIRGINIA SCOTT JENKINS, *THE LAWN: A HISTORY OF AN AMERICAN OBSESSION* (1994). Golf courses, especially municipal ones, are under pressure to use water. Golf course acreage is declining in the United States and a variety of conservation strategies are available to them. *See* Travis W. Shaddox, *Water Use and Management Practices on U.S. Golf Courses*, CROP, FORAGE & TURFGRASS MGMT., June 8, 2022, at 5, 8. However, there is push back. In February 2023, the Utah legislature failed to advance a bill that would require golf courses to report water usage because the information could lead to "uninformed conclusions." Brian Maffly, *Utah Lawmakers Say More Information About Golf Course Water May Lead to Uniformed Conclusions*, SALT LAKE TRIB. (Feb. 16, 2023), <https://www.sltrib.com/news/environment/2023/02/15/utah-lawmakers-say-more/> [https://perma.cc/5NFQ-NCK6].

129. *See* Sullivan & Tarlock, *supra* note 108, at 70 ("More and more cities in the arid Southwest and Intermountain West are giving up the Midwestern ideal of verdant lawns[.]").

130. *See* JENKINS, *supra* note 128, at 14, 16.

131. As late as 2013 an Arizona newspaper writer complained about the invasion of Midwesterners who "grow lawns, plant non-native trees and complain about the heat." Josh Brodesky, *Midwesterners Pose Arizona's Real Invasion Threat*, ARIZ. DAILY STAR (July 5, 2012), https://tucson.com/news/local/josh-brodesky-midwesterners-pose-arizonas-real-invasion-threat/article_6a44a8d4-de30-5e3f-902e-f8dd986fc33e.html [https://perma.cc/566C-LJDM].

132. *See* Sullivan & Tarlock, *supra* note 108, at 70.

133. *See id.*

from doing so.¹³⁴ The native plant movement is not restricted to the arid areas.

No city has prohibited residential lawns, but they are discouraging them. Las Vegas is a prime example. Las Vegas draws most of its water supply from the nearby Colorado River.¹³⁵ In 1922, Colorado feared that California would claim almost the entire supply of the River under the law of prior appropriation.¹³⁶ This led to an interstate compact which divided the River equally between the Upper and Lower Basins.¹³⁷ The Compact did not allocate water among states, but in 1963, the Supreme Court held¹³⁸ the Boulder Canyon Project Act of 1928, which authorized the construction of the Hoover Dam, allocated the River among the three Lower Basin states.¹³⁹ Because Las Vegas was a small railroad town, Nevada was awarded only 300,000 acre-feet, whereas California and Arizona got 4,400,000 and 2,800,00 acre-feet respectively.¹⁴⁰ However, Las Vegas has been able to grow within its allocation. In 2021, Nevada's Colorado River allocation was cut to 279,000 acre-feet.¹⁴¹ But the metropolitan area has been able to use even less than the cut because of aggressive conservation measures such as the use of recycled water in the Vegas Strip's iconic fountains, and programs that pay people to tear up their turf lawns.¹⁴²

The Phoenix area, facing substantial cuts in Colorado River availability, is at the forefront of the so-called fight against grass. In 2022, Arizona amended its common interest community law to provide that “notwithstanding any provision in the community documents, in any planned

134. See Cara Buckley, *They Fought the Lawn. And the Lawn's Done.*, N.Y. TIMES, (Dec. 20, 2022), <https://www.nytimes.com/2022/12/14/climate/native-plants-lawns-homeowners.html> [https://perma.cc/RH82-NCTX].

135. See BENSON ET AL., *supra* note 113, at 361.

136. See *Arizona v. California*, 373 U.S. 546, 556 (1963) (“In view of California’s phenomenal growth, the Upper Basin States had particular reason to fear that California, by appropriating and using Colorado River water before the upper States, would, under the interstate application of the prior appropriation doctrine, be ‘first in time’ and therefore ‘first in right.’”). In 1922, the Supreme Court confirmed this fear by holding that when states seek an equitable apportionment on an interstate river and all follow the doctrine of prior appropriation, the court will basically protect existing uses. See *Wyoming v. Colorado*, 259 U.S. 419, 484 (1922).

137. See *Colorado River Compact*, 43 U.S.C. § 617l.

138. See *Arizona v. California*, 373 U.S. at 564–65.

139. See 43 U.S.C. § 617–617v.

140. See *Arizona v. California*, 373 U.S. at 565.

141. See *Colorado River Compact Agreement*, CITY OF LAS VEGAS (Aug. 26, 2021), <https://www.lasvegasnevada.gov/News/Blog/Detail/colorado-river-compact-agreement> [https://perma.cc/W68W-BHUE].

142. See Sullivan & Tarlock, *supra* note 108, at 68–69; Heather Hansman, *How Sin City Finally Learned to Sustain Itself*, ADVENTURE.COM (May 1, 2023), <https://adventure.com/how-las-vegas-conserves-water/> [https://perma.cc/2EHK-YSGW].

community that allows natural grass on a member's property . . . the association may not prohibit installing or using artificial turf on any member's property."¹⁴³ Scottsdale, Arizona was able to convince both residents and homeowner associations ("HOAs") to support an ordinance preventing HOAs from requiring the overseeding of lawns.¹⁴⁴ Similarly, in 2022, the California State Water Resources Control Board extended an *emergency regulation* that prohibits "wasteful water uses," such as the irrigation of public street medians.¹⁴⁵

The second example is the growing use of treated sewage water mixes to supply potable drinking water. Cities have long used reclaimed or treated sewage water to irrigate golf courses and to supply fountains. A 2016 National Academy of Sciences report explained:

Stormwater and graywater can serve a range of non-potable uses, including irrigation, toilet flushing, washing, and cooling, although treatment may be needed. Stormwater may also be used to recharge groundwater, which may ultimately be tapped for potable use. In addition to increasing of local water supply, harvesting storm water has many potential benefits, including saving energy, preventing pollution, reducing the impacts of development on urban streams, and enhancing the livability of cities.¹⁴⁶

More broadly, storm water harvesting is just one example of how cities will have to consider using previously undesirable sources of water to meet service obligations.

Urban areas are going further. Orange County has been using "indirect potable reuse," i.e., the storage of treated wastewater in aquifers before distribution as drinking water, for over two decades with no adverse public health impacts.¹⁴⁷ The practice is not confined to the arid West. The Norfolk,

143. ARIZ. REV. STAT. § 33-1819 (2022).

144. See Valerie Schneider, *Scottsdale City Council Passes First-Known State Code Amendment Regarding Overseeding*, CITY OF SCOTTSDALE (Sept. 21, 2022), <https://www.scottsdaleaz.gov/news/Scottsdale-City-Council-passes-first-known-state-code-amendment-regarding-overseeding> [<https://perma.cc/N9TU-VVYY>].

145. See *Emergency Regulations to Save Water*, SAVE OUR WATER (Dec. 12, 2022), https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/regs/docs/2023/StatewideWaterRestrictions_Flyer_121322_ACC.pdf [<https://perma.cc/96G2-3KU2>]; *State Water Board Re-Ups Ban On Wasteful Water Uses amid Drought*, CAL. WATER BOARDS (Dec. 9, 2022), https://www.waterboards.ca.gov/press_room/press_releases/2022/pr12092022-water-waste-prohibitions-readoption.pdf [<https://perma.cc/XZ5R-ATCD>] ("The regulation was originally adopted in January 2022 and is now extended until January 2024.")

146. See National Academy of Sciences, *Using Greywater and Stormwater to Enhance Local Water Supplies: An Assessment of Risks, Costs, and Benefits 1* (2016).

147. See Jacques Leslie, *Where Water is Scarce, Communities Turn to Reusing Wastewater*, YALE ENV'T 360 (May 1, 2018), <https://e360.yale.edu/features/instead-of-more-dams-communities-turn-to-reusing-wastewater> [<https://perma.cc/E4PE-T2T2>]; The Department of Energy was required to waive federal preemption under the Energy Policy Act of 1992. See 42 U.S.C. §§ 6295(j)(3)(3) & (k)(3). The Act required the Department to waive

Virginia area is losing its fresh water supply due to saltwater intrusion caused by rising sea levels.¹⁴⁸ To meet demand, the water provider is following Orange County, California, and mixing fresh water with treated sewage.¹⁴⁹ 11 states now authorize the process.¹⁵⁰

C. Strengthening The Land Use Water Supply Interaction

Historically water supply and land use planning were separate local government functions performed by different agencies. This separation was based on the pre-GCD widespread belief that engineers could overcome any water scarcity problems through carry-over storage.¹⁵¹ Land use planners and zoning authorities set urban development patterns, and water suppliers found the necessary water to meet the demand, no questions asked.¹⁵²

Starting in the 1990s, the gap between water supply and land use planning began to close.¹⁵³ One of the land use consequences of the environmental movement was, especially in rapidly growing areas, a growing taste for growth management, either timed growth to match a city's capacity to serve the growth, growth based on the natural carrying capacity of the area, or less

preemption if the American Society of Mechanical Engineers did not promulgate new toilet and showerhead standards by 2001. *Id.* In December 2019, President Trump ordered a review of the EPA's federal standards, which was promptly terminated because they are not regulations but rather congressionally mandated. Cayli Baker, *The Trump Administration's Major Environmental Deregulations*, BROOKINGS (Dec. 15, 2020), <https://www.brookings.edu/articles/the-trump-administrations-major-environmental-deregulations/> [https://perma.cc/3KWL-U3JR].

148. See VA. ACAD. SCI., ENG'G, & MED., *supra* note 10, at 34.

149. See Elena Shao, *There's Something in the Water in Virginia. Before You Say 'Yuck,' Wait.*, N.Y. TIMES, <https://www.nytimes.com/2022/10/20/climate/treated-sewage-virginia-aquifer.html> [https://perma.cc/XVE3-N5XT] (last updated Nov. 10, 2022). Orange County now recycles 100% of reclaimable sewage flows. See *Orange County Completes World's Largest Wastewater Recycling and Purification System*, CAL. WATER BOARDS (Apr. 14, 2023), https://www.waterboards.ca.gov/press_room/press_releases/2023/pr20230414-orange-county-replenishment.pdf [https://perma.cc/WL6X-5HNH].

150. See Leslie, *supra* note 147.

151. See generally, e.g., A. Dan Tarlock, *Water Supply as a New Growth Management Tool*, 50 LAND USE L. & ZONING DIG. 3 (1998).

152. See *id.* at 4.

153. A. Dan Tarlock & Lora Lucero, *Connecting Land, Water, and Growth*, 54 LAND USE L. & ZONING DIG., Apr. 2002, at 3. The Sabin Center for Climate Change Law at Columbia University reports that the California Attorney General dismissed a challenge to a lower court's approval of a large development after the developer agreed to project changes including "a prohibition on the use and extension of natural gas infrastructure in the project site . . ." See *Center for Biological Diversity v. County of Lake*, SABIN CTR. FOR CLIMATE CHANGE LAW: CLIMATE CHANGE LITIG. DATABASES (citing *People v. County of Lake*, No. A165677 (Cal. Ct. App. Jan. 11, 2023)), <http://climatecasechart.com/case/center-for-biological-diversity-v-county-of-lake/> [https://perma.cc/QU2Q-N6MU] (last updated Jan. 11, 2023).

growth period.¹⁵⁴ The availability of adequate long-term water supplies emerged as a major issue. States such as California began to adopt so-called “show me the water” laws which required large developers to prove to local land use authorities that adequate water supplies had been secured.¹⁵⁵ However, governments in urban areas rejected any discussion of “natural” limits to continued growth.¹⁵⁶ Nonetheless, concern over continued development and urban water supply continued to grow in the West and other places such as Florida.¹⁵⁷ A recent study summarized the likely impacts of prolonged drought on urban water supplies: “1) The sprawl development pattern can result in more water consumption due to higher quantities of water used for outdoor activities such as landscape irrigation. 2) The sprawl development pattern can increase magnitude, intensity, duration, and frequency of water shortage events with higher impacts on magnitude and duration.”¹⁵⁸

Many cities have ignored these problems, but a few such as Santa Fe, New Mexico have adapted water budgets.¹⁵⁹ To keep supply and demand in balance, these cities stipulate that new growth developers must retire existing rights to supply the new development.¹⁶⁰ Cities that depend on groundwater supplies face two related problems. First, aquifers continue to be mined (water is withdrawn in excess of recharge rates).¹⁶¹ Second, urban development often paves over recharge areas cutting off recharge.¹⁶² In general, cities have not yet dealt effectively with these problems.¹⁶³ In the future, cities will need to integrate water supply and land use functions to optimize the amount of water they can sustainably provide to their residents.

154. This is the root of the current affordable housing crisis in many areas. *See, e.g.*, A. Dan Tarlock, *Land Use Regulation: The Weak Link in Environmental Protection*, 82 WASH. L. REV. 651, 661–62 (2007). However, this topic is beyond the scope of this Essay.

155. *See* Sullivan & Tarlock, *supra* note 108, at 73; A. Dan Tarlock, *How California Local Governments Became Both Water Suppliers and Planners*, 4 GOLDEN GATE U. ENV'T L.J. 7, 24–25 (2010).

156. *See* A. Dan Tarlock & Sarah B. Van de Wetering, *Western Growth and Sustainable Water Use: If There Are No “Natural Limits,” Should We Worry About Water Supplies?*, 27 PUB. LAND & RES. L. REV. 33, 38 (2006).

157. *Id.* at 64.

158. Hadi Heidari et. al., *Effects of Urban Development Patterns on Municipal Water Shortage*, 3 FRONTIERS WATER 1, 8 (2021), <https://www.frontiersin.org/articles/10.3389/frwa.2021.694817/full> [<https://perma.cc/5522-8LUN>].

159. *See* Sullivan & Tarlock, *supra* note 108, at 73.

160. *See id.*

161. *See* Dave Owen, *Law, Land Use, and Groundwater Recharge*, 73 STAN. L. REV. 1163, 1201–02 (2021).

162. *See id.* at 1180.

163. *See id.* at 1184–88.

CONCLUSION: WHAT MIGHT FUTURE WATER STEWARDSHIP LOOK LIKE?

This Essay has attempted to characterize a number of developments that increased the duties on urban water suppliers to consider the environmental and social impacts of the water sources on distant and local sources of water. Today, the term “urban water stewardship” describes what has happened since the 1980s rather than a firm legal duty. But global climate destruction will put increasing pressure on water suppliers to adopt practices consistent with this duty. At this point, there are more questions than answers.

The first question is to whom a duty of stewardship is owed. It is clearly owed to people in the service area; and one can argue, based on the examples sketched here, that it is also owed to residents and the environment of the area of origin. In general, water providers owe no duty to provide service to those outside the service area.¹⁶⁴ However, should a claimed human right to water be recognized, modifying long-established law in the name of environmental justice, the argument might be made that water providers owe duties far beyond just those in the area of origin and the surrounding service area.¹⁶⁵ In fact, the UN has already recognized access to water and sanitation

164. *See, e.g., City of Randleman v. Hinshaw*, 2 N.C. App. 381, 384 (1968) (“A municipality which operates its own water and sewer system is under no duty to furnish water or sewer service to persons outside its limits.”). The residents of Rio Verde Hills, an unincorporated area adjacent to Scottsdale, Arizona felt the sting of this long-established doctrine when Scottsdale decided that an ongoing drought required that it limit its water service to its residents. *See* Complaint for Plaintiff, *Walker v. City of Scottsdale*, No. CV 2023-00545, at 1–6 (Ariz. Sup. Ct. Jan. 12, 2023). The district court of Maricopa County denied a request to resume service. *See* Court Order, *Walker v. City of Scottsdale*, No. CV 2023-00545, at 1–3 (Ariz. Sup. Ct. Jan. 20, 2023); *Judge Sides with Scottsdale after Rio Verde Foothills Residents Sue Over Water Access*, 12NEWS (Jan. 23, 2023, 4:24 AM), <https://www.12news.com/article/news/local/water-wars/rio-verde-foothills-residents-file-lawsuit-against-scottsdale-over-loss-of-water-services/75-6f73e740-1852-4cce-9080-92c917009a88> [<https://perma.cc/GZ57-6TSQ>]. Since this article was written, the state of Arizona has taken an aggressive step to limit development in the Greater Phoenix area. In brief, in 1980, Arizona was forced to adopt a stringent groundwater conservation law to obtain Congressional approval of the Central Arizona project, which brings water to the center of the state from the Colorado River. Active Management Areas, primarily in urban areas, were created to stop aquifer depletion, which is still a work in progress. In these areas, new developments must demonstrate that they have a 100-year water supply. In Phoenix and other major cities such as Tempe and Mesa, this obligation can be met by obtaining water from a certified water provider. But for peripheral area, no certification exists. The state has announced that no new, as opposed to permitted, development that depends solely on groundwater will be permitted. *See* Christopher Flavelle & Jack Healy, *Arizona Limits Construction Around Phoenix as Its Water Supply Dwindles*, N.Y. TIMES (June 1, 2023), <https://www.nytimes.com/2023/06/01/climate/arizona-phoenix-permits-housing-water.html> [<https://perma.cc/VTJ6-3XGZ>].

165. For a well-researched argument that water providers should engage in water resilience justice planning to ensure that marginalized communities get the full benefit of adequate and

as a basic human right, fundamental to health, dignity, and prosperity.¹⁶⁶ Specifically, a human rights-based approach (HRBA) to water and sanitation improvements would further equitable access to water for those marginalized populations who have been historically overlooked and excluded, “so that no one gets left behind.”¹⁶⁷

The next question is, if the duty is limited to service area residents and the area of origin, what might water stewardship duties look like? I suggest three first order principles. First, water suppliers should make a diligent effort to use local water supplies. This would include, as Los Angeles is doing, capturing neglected supplies such as storm water run-off and river restoration. Second, suppliers must do a better job of integrating water supply and urban development planning. Just as most individuals must balance income and expenditures to sustain themselves, cities need to ensure that sufficient, climate destruction-adjusted, long-term water supplies are available to support growth.

Finally, cities must be more aggressive in curtailing excessive, unnecessary water use. Perhaps the greatest failure of the environmental movement has been the failure to get a large majority of the population to internalize the idea of a lighter footprint on the natural world.¹⁶⁸ This is especially relevant to efforts to deal with GCD. The environmental movement has walked a narrow line between respecting the liberal tradition of individual choice and imposing limits on the earth’s bounty.¹⁶⁹ Fears of so-called eco-fascism have tilted the balance toward using carrots rather than sticks to change human behavior.¹⁷⁰ I do not know what the necessary balance is, but climate destruction requires some movement of the needle toward restricted choice to more equitably share an increasingly scarce resource necessary for human life.

safe supplies household water, see generally Craig Anthony Arnold, *Resilience Justice and Urban Water Planning*, 52 SETON HALL L. REV. 1399 (2022).

166. See *Human Rights to Water and Sanitation*, UNITED NATIONS: UN-WATER, <https://www.unwater.org/water-facts/human-rights-water-and-sanitation> [https://perma.cc/SX6R-LRZ3] (last visited Aug. 1, 2023).

167. *Id.*

168. The literature on this subject is vast. For a relatively recent summary see generally Karen White et al., *How to SHIFT Consumer Behaviors to be More Sustainable: A Literature Review and Guiding Framework*, 83 J. MKTG. 22 (2019).

169. There has always been a concern that the exaltation of the natural world, which the Nazis did, could contribute to a totalitarian state. See generally JANET BIEHL & PETER STAUDENMAIER, *ECOFASCISM REVISITED: LESSONS FROM THE GERMAN EXPERIENCE* (2011).

170. *Id.*