

CALMING TROUBLED WATERS: LOCAL SOLUTIONS

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INTRODUCTION

A. A Watershed Moment

The event was a local land use leadership training program in the upstate New York Sawkill Watershed on controlling the alarming risks of water pollution. Local land use board members and elected officials gathered to learn how to prevent public health and ecosystem harms caused by the effects of land use and development on local water quality.¹ After we covered the local land use strategies suitable to the task, we asked for questions. Margaret, a local planning board chair, whose family member was diagnosed with cancer attributed to drinking contaminated water, raised her hand. She asked us to explain this country's water law system and why, despite federal and state environmental laws, she and her fellow local leaders had to use their municipal land use authority to prevent water pollution. This seemingly simple question, which we were unable to answer to her satisfaction, led to the Land Use Law Center's two-year water law project and was the impetus for this Article.²

1. The Land Use Law Center regularly conducts multi-day Land Use Leadership Training Programs for local officials from the 250 municipalities in the Hudson River Valley. *See Land Use Leadership Alliance Training Program*, PACE UNIV. ELISABETH HAUB SCH. OF LAW, <https://law.pace.edu/land-use-leadership-alliance-training-program> (last visited Dec. 30, 2019) (providing information about the training program). Haub students conduct research on the land use issues that the leaders raise in these training initiatives. *Id.*

2. The author developed this article in conjunction with delivering the 15th Annual Distinguished Norman Williams Lecture at Vermont Law School in the spring of 2019. Among many of his accomplishments, Professor Williams maintained a two-volume casebook on American Land Planning Law. 1 NORMAN WILLIAMS, JR., *AMERICAN LAND PLANNING LAW: CASES AND MATERIALS INTRODUCTION* (2012). The final sentence of his Introduction to the casebook reads: "If experience in this field teaches anything, it suggests that not all wisdom is derived from reported appellate opinions. Life in the real world is quite different, and those facets which are really important in understanding the actual

Margaret’s question cuts through all of the nuanced jurisprudential and ideological rhetoric and analysis that characterizes so many law school water law colloquia and so much legal scholarship. It goes directly to the heart of the issue. If we cannot explain clearly how the legal system actually works and how to solve present problems, then we lose credibility in discussions in city halls, courtrooms, and the classroom. Instead of expressing an opinion about a pending federal rule change or a U.S. Supreme Court decision regarding some nuance of federal water law, Margaret’s question requires that we explain water law so she can decide what to do to address her community’s water problem. Should she lobby Congress, the Environmental Protection Agency (EPA), the state legislature, one or more state agencies, or her city council or town board? If the legal system is not logical, we need to explain why and offer some solutions that can be employed now for Margaret, her family, and her watershed.

B. The “Occult” Origins of Water Law

In 1861, the Ohio Supreme Court decided *Frazier v. Brown*, in which it adopted the Absolute Use Rule of groundwater use.³ The doctrine stood until 1984, when, in *Cline v. American Aggregates*, the court reversed course and adopted the *Restatement’s* Reasonable Use Rule.⁴ The *Frazier* court held that

the law recognizes no correlative rights in respect to underground waters percolating, oozing or filtrating through the earth Because the existence, origin, movement and course of such waters, and the causes which govern and direct their movements, are so secret, occult and concealed, that an attempt to administer any set of legal rules in respect to them would be involved in hopeless uncertainty, and would be, therefore, practically impossible.⁵

problem often do not filter through the legal process. In a word, read, mark, and inwardly ponder these materials—but don’t believe a word of it.” *Id.*

3. *Frazier v. Brown*, 12 Ohio St. 294, 311 (1861).

4. *See Cline v. Am. Aggregates Corp.*, 474 N.E.2d 324, 327 (Ohio 1984) (holding “that the better standard to apply to groundwater issues is found in the Restatement of the Law 2d, Torts, Section 858. Section 858 applies a reasonable use doctrine to underground water . . .”).

5. *Frazier*, 12 Ohio St. at 311; *see also Chatfield v. Wilson*, 28 Vt. 49, 51 (1855) (holding that it is best to allow groundwater to be “enjoyed absolutely by the owner of the land,” recognizing no correlative right to groundwater between adjoining proprietors of land and refusing to regulate it due to practical uncertainties).

This rendered neighbors who share the use of a groundwater aquifer nearly impotent; the unreasonable use of their shared resource was *damnum sine injuria*: a wrong without a remedy.

In *Cline*, the court reversed course, noting that

a primary goal of water law should be that the legal system conforms to hydrologic fact. Scientific knowledge in the field of hydrology has advanced in the past decade to the point that water tables and sources are more readily discoverable. [With notable exceptions, it is now possible for land use professionals to trace the impact of pumping groundwater to serve one parcel on the quantity and quality of groundwater underlying neighboring properties.] Thus, liability can now be fairly adjudicated with these advances which were sorely lacking when this court decided *Frazier* more than a century ago.⁶

What science now reveals is the extraordinary close relationship between land use and development and the quality of water and health of watersheds.⁷ Part I of this Article explores the advance of scientific knowledge related to water pollution, and, based on that knowledge, describes the clear relationship between land use and water pollution.⁸ Land development increases impervious surface areas, compacts soils, removes vegetation, and alters the flow of water above and below ground.⁹ If not carefully engineered, development can severely diminish the quality of water.¹⁰ Uncontrolled development increases the volume and rapidity of stormwater runoff, decreases infiltration, exacerbates flooding, and causes soil erosion and sedimentation.¹¹ Runoff moving across developed surfaces picks up pollutants and sediments and carries them, unfiltered, into surface waters.¹² We call this nonpoint source pollution (NPS), defined as “runoff,

6. *Cline*, 474 N.E.2d at 328.

7. See *infra* Parts I–II.

8. See *infra* Part I.

9. *Growth and Water Resources: Impervious Surfaces and the Hydrologic Balance of Watersheds*, EPA WATERSHED ACAD. WEB, https://cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_object_id=170 (last visited Dec. 27, 2019).

10. *Smart Growth and Water: Background*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/smartgrowth/smart-growth-and-water> (last visited Dec. 27, 2019).

11. See EARL SHAVER ET AL., N. AM. LAKE MGMT. SOC’Y, FUNDAMENTALS OF URBAN RUNOFF MANAGEMENT: TECHNICAL AND INSTITUTIONAL ISSUES 16–17 (2d ed. 2017), [https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/77FFADF0D8FEB2E485257C62005376F2/\\$FILE/Att%2013%20Fundamentals%20of%20Urban%20Runoff.pdf](https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/77FFADF0D8FEB2E485257C62005376F2/$FILE/Att%2013%20Fundamentals%20of%20Urban%20Runoff.pdf) (discussing the effects of land use change and land stormwater runoff).

12. *What Is Sediment Pollution?*, MID-AM. REG’L COUNCIL, https://cfpub.epa.gov/npstbx/files/ksmo_sediment.pdf (last visited Dec. 27, 2019).

precipitation, atmospheric deposition, drainage, seepage or hydrologic modification.”¹³ It comes from many diffuse sources and is considered the leading source of domestic water quality problems.¹⁴ State governments report that 40% of all their impaired waters are contaminated solely by NPS.¹⁵

C. Fragmentation of Water Law: Troubled Waters

Part II reveals the unfortunate fact that federal law, despite these advances in scientific knowledge, does not conform to hydrologic fact but remains “occult,” that is, mysterious and of limited help to local officials searching for practical solutions for their water problems.¹⁶ It goes on to sketch the plenary powers of state governments to use their reserved police powers to protect natural resources, such as watersheds, and the delegation of that power to local governments through the authority to adopt land use plans, zoning laws, and land use regulations.¹⁷

The drinking water serving most homes in Margaret’s community comes from groundwater wells, and much of the surface water pollution in her community is due to nonpoint source pollution, caused by surrounding development and land uses. She was surprised to learn that the Clean Water Act (CWA) effectively regulates neither of these. It is limited in its reach. Non-navigable waters,¹⁸ groundwater,¹⁹ and nonpoint sources all fall outside the statute’s regulatory scope.²⁰ Federal authority can therefore only go so far, leaving many gaps to be filled by the states and the municipalities to

13. *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 Dec. 27, 2019).

14. *Id.*

15. *Introduction to the Clean Water Act*, EPA WATERSHED ACAD. WEB, https://cfpub.epa.gov/watertrain/moduleFrame.cfm?parent_object_id=2788 (last visited Dec. 27, 2019).

16. *See infra* Part II.

17. *See infra* Part II.

18. *See* 33 U.S.C. § 1311(a) (2012) (prohibiting “the discharge of any pollutant by any person”); 33 U.S.C. § 1362(12) (2012) (defining “discharge” as “any addition of any pollutant to navigable waters from any point source”).

19. *See* Definitions, 40 C.F.R. § 230.3(o)(2)(v) (2015) (exempting groundwater from the definition of waters of the United States); Revised Definition of “Waters of the United States”, 84 Fed. Reg. 4154, 4155 (proposed Feb. 14, 2019) (to be codified at 33 C.F.R. pt. 328 and 40 C.F.R. pts. 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401) (exempting groundwater from the proposed redefinition of waters of the United States); *see also* *Washington Wilderness Coal. v. Hecla Mining Co.*, 870 F. Supp. 983, 990 (E.D. Wash. 1994) (finding that courts generally agree that the Clean Water Act “do[es] not include ‘isolated/nontributary groundwater,’” but that courts are split on “whether tributary groundwater . . . is subject to CWA regulation”).

20. 33 U.S.C. § 1362(12).

which they delegate power to regulate land use.²¹ State and local regulations can go beyond the limits of the CWA,²² reaching isolated wetlands and intrastate waters,²³ groundwater, and the sources of nonpoint source pollution.²⁴

Because of statutory, regulatory, and constitutional disconnections, the waters of the United States are troubled.²⁵ Calming them, and answering Margaret's question, may depend on where one stands and where one observes the water law system. An apt metaphor is provided by Benjamin Franklin, who described what happened when he dropped a cruet of oil on the rough waters of the pond at Clapham Common and watched

it spread itself with surprising swiftness upon the surface; but the effect of smoothing the waves was not produced; for I had applied it first on the leeward side of the pond, where the waves were largest, and the wind drove my oil back upon the shore. I then went to the windward side, where they (the waves) began to form; and the oil, though not more than a teaspoonful, produced an instant calm over a space of several yards square, which spread amazingly, and extended itself gradually till it reached the lee side, making all that quarter of the pond, perhaps half an acre, as smooth as a looking glass.²⁶

This Article stands on the windward side of the waters, where the troubles begin. That is to say, it observes the problems where they first occur, on the lands around the local ponds, lakes, streams, wetlands, and rivers, and above groundwater aquifers.²⁷ Water pollution is a local phenomenon; it affects local people and engages, as if by instinct, local legal powers.²⁸ It is critical that we understand the authority that resides in this windward space

21. *Id.*

22. *See Hess v. Port Auth. Trans-Hudson Corp.*, 513 U.S. 30, 44 (1994) (“[R]egulation of land use [is] a function traditionally performed by local governments.”).

23. *See* Paul Edward Svensson, *The Supreme Court's New Federalism: The Authority of the U.S. Army Corps of Engineers Does Not Extend Over Isolated Intrastate Wetlands Under the Migratory Bird Rule*, 19 PACE ENVTL. L. REV. 165, 194 (2001) (footnote omitted) (“[O]nly a state possesses the authority to regulate land and water use in isolated, intrastate wetlands.”).

24. *See* 33 U.S.C. § 1329(a)(1)(d) (2012) (describing state assessment report contents, requiring states to identify and describe programs to control nonpoint sources of pollution); *Id.* § 1329(b)(1) (describing state management program requirements for nonpoint source pollution).

25. *See infra* Part II.

26. CHARLES TANFORD, *BEN FRANKLIN STILLED THE WAVES: AN INFORMAL HISTORY OF POURING OIL ON WATER WITH REFLECTIONS ON THE UPS AND DOWNS OF SCIENTIFIC LIFE IN GENERAL* 83–84 (Oxford Univ. Press 2004) (1989).

27. *See infra* Part I.

28. *See infra* Part II.A.

and to learn how to use it collaboratively to fill the significant gaps in state and federal water law.²⁹

D. Local Solutions

In Part III, the Article describes a host of local government gap-filling strategies that protect water quality and promote water conservation.³⁰ These include: aquifer and watershed overlay zoning, open space provisions in land use plans, urban growth boundaries, designated priority areas for growth, designated water conservation areas, creation of rain gardens and sedimentation ponds, cluster development requirements to avoid development in vulnerable watershed areas, sedimentation controls of surface mining operations, special limitations on water use in subdivisions that exceed recharge levels, density bonuses for water-conserving features in residences, aquifer protection districts, required wetland creation, use of pervious cover and detention ponds, adoption of EcoDistricts with provisions that lower per capita water consumption, use of a green building checklist including water conservation measures, adoption of tree preservation ordinances and Urban Tree Canopy goals, mandatory well testing provisions, stormwater management fees with incentives to reduce impervious coverage, local water conservation and permitting laws, and public nuisance laws.³¹

These laws are adopted by local governments to fit the unique circumstances of each one, demonstrating the difficulty that a remote state or federal legislature might have in legislating to protect water quality and other public values.³² Many of the local solutions described in this Part are not within the regulatory authority of the federal government and beyond the reach of the power that state legislatures have given their state water, health, and environmental conservation agencies.³³

E. Collaborative Subsidiarity

Critics of delegating land use authority to towns, villages, and cities cite several deficiencies in relying on such a parochial system of law.³⁴ They push back against the principle of subsidiarity, the notion which “holds that responsibility for dealing with a problem should be delegated to the most

29. *See infra* Part II.

30. *See infra* Part III.

31. *See infra* Part III.

32. *See infra* Part III.

33. *See infra* Part V.B.

34. *See infra* notes 35–39 and accompanying text.

decentralized institution capable of handling that problem.”³⁵ The list of concerns includes the limited geographical jurisdiction of municipal governments,³⁶ their lack of technical capacity, inadequate financial resources, and resistance to mandates from state and federal agencies.³⁷ Anti-localist scholars point to numerous additional reasons why untethered local control of land use is a bad idea.³⁸ They cite a “race to the bottom” mentality, NIMBYism, inadequate information, and insufficient funding.³⁹

Part IV identifies and discusses several approaches to addressing these local deficiencies and how states, often, and federal agencies, less frequently, act to help overcome local barriers to effective action.⁴⁰ They include the provision of technical assistance, data, and model laws; state-mandated environmental impact review; authority to collaborate with neighboring municipalities; intergovernmental watershed planning; integration of small water providers and waste water systems; and the creation of flexible regional networks.⁴¹

In Part V, the Article continues with an analysis of the many theorists who support grassroots efforts to solve land use problems.⁴² The literature is filled with theories, such as the subsidiarity principle,⁴³ complex adaptive systems,⁴⁴ diffusion of innovation,⁴⁵ and flexible regional networks,⁴⁶ among

35. ROBERT ELLICKSON, *LOSING GROUND: A NATION ON EDGE* 274 (John R. Nolon & Daniel B. Rodriguez eds., 2007). “Although various definitions of this principle exist, they generally share in common the implication that any particular task should be decentralized to the lowest level of governance with the capacity to conduct it satisfactorily This conviction implied that a higher level of organization should refrain from undertaking tasks that could be performed just as well by a grouping closer to the individual.” Graham R. Marshall, *Nesting, Subsidiarity, and Community-Based Environmental Governance Beyond the Local Level*, 2 INT’L J. COMMONS 75, 80 (2008).

36. *See Golden v. Planning Bd. of Town of Ramapo*, 285 N.E.2d 291, 299 (N.Y. 1972). (stating that New York’s “current zoning enabling legislation is burdened by the largely antiquated notion which deigns that the regulation of land use and development is uniquely a function of local government.”) The court referenced criticisms of community autonomy finding that local land use control suffers from “pronounced insularism” and produces “distortions in metropolitan growth patterns.” *Id.* It also noted that local control “crippl[es] efforts toward regional and State-wide problem solving, be it pollution, decent housing, or public transportation.” *Id.* (citation omitted).

37. *See* Rena I. Steinzor, *Unfunded Environmental Mandates and the “New Federalism”*: *Devolution, Revolution, or Reform?*, 81 MINN. L. REV. 97, 174–75 (1996) (arguing that local regulations will often keep only their local interest in mind when federal regulation does not exist or apply).

38. *See infra* Part V.B.

39. *See infra* note V.B.

40. *See infra* Part IV.

41. *See infra* Part IV.

42. *See infra* Part V.A.

43. *See infra* note 396 and accompanying text.

44. *See infra* notes 520–22 and accompanying text.

45. *See infra* note 517 and accompanying text.

46. *See infra* Part IV.F.

others.⁴⁷ The Part continues with a second look at, and further analysis of, the articles that are critical of reliance on local governments.⁴⁸ The critics concede that local governments need to be involved in governmental systems to protect natural resources, even if such structures are to be assisted, initiated, or controlled by regional, state, or federal actors.⁴⁹ There is disagreement among them as to which higher level of government should be the relevant actor.⁵⁰ Some suggest state initiatives under a subfederal approach, others discuss federal-local structures with local officials acting as federal agents, some point to voluntary compacts with neighboring communities, and still others propose strong regional bodies.⁵¹

This Article concludes that there is general agreement among many scholars that local governments must play a key role in land use regulation, but that municipal governments need assistance and that collaborative structures should be created where inter-jurisdictional issues are involved.⁵² The Article ends by proposing that the precise partnership needed depends on the problem being addressed, the circumstances of the situation, and the prevailing political culture.⁵³ To accommodate the diversity of situations and the need for flexibility in approach, it constructs, explains, and recommends that strategists embrace the Principle of Collaborative Subsidiarity.⁵⁴

I. UNDERSTANDING THE LAND USE IMPACTS ON THE WATER SYSTEM⁵⁵

Science has filled in many of the gaps that stymied judicial protection of groundwater in the *Frazier* case and obstructed a clear understanding by regulators of the connectivity of surface waters, wetlands, and groundwater.⁵⁶

47. See *infra* Part V.

48. See *infra* Part V.B.

49. See *infra* Part V.C.

50. See *infra* Part V.C.

51. See *infra* Part IV.

52. See *infra* Part V.C.

53. See *infra* Part V.C.

54. See *infra* Part V.C.

55. The author gratefully acknowledges the contributions to this Part made by the two members of the research team who are joint degree students at Yale in the School of Forestry and Environmental Studies: Anthony Mazza, from Elisabeth Haub School of Law at Pace University, and Christopher Denny, from Vermont Law School.

56. See Phillip Brunner et al., *Above and Below: Understanding River-Groundwater Exchanges*, EOS (Jan, 26, 2018), <https://eos.org/editors-vox/above-and-below-understanding-river-groundwater-exchanges> (asserting that “[f]ield data, new technologies, numerical modelling, and geostatistical methods can be combined to improve understanding of the interactions between surface water and groundwater”); see also Helmholtz Ass’n of German Research Ctrs., *15 Years of GRACE: Satellite Mission Flies Thrice Its Planned Time*, PHYS.ORG NEWS (Mar. 14, 2017), <https://phys.org/news/2017-03-years-grace-satellite-mission-flies.html> (telling the story of the GRACE satellite mission, which observes changes in the water cycle from space).

The failure of courts and legislatures to adequately protect drinking water is no longer caused by the lack of knowledge about how the hydrological system works.⁵⁷ Science, as well, provides us with a clear understanding of how land use and development can adversely affect surface and groundwater and the other components of the natural water system.⁵⁸ It is now the law that must catch up with impressive advances in science.

*A. Connectivity of the Waters of the United States*⁵⁹

Starting with the fundamentals, scientists divide the water cycle into two components: the atmospheric and the terrestrial.⁶⁰ In its atmospheric form, water vapor rises into the sky after evaporating from the surface of the land.⁶¹ Evaporation occurs when surface waters (rivers, streams, and oceans) are heated and transform from a liquid to a gaseous state.⁶² Evapotranspiration contributes to atmospheric water when it transpires into the air by plant respiration.⁶³ Sublimation, which is the transformation of solid snow and ice directly into water vapor, also adds moisture to the atmosphere.⁶⁴

Groundwater, wetlands, and surface water are the water cycle's terrestrial forms.⁶⁵ Once water vapor rises into the atmosphere, cooler temperatures cause condensation of water molecules to form clouds.⁶⁶ Clouds create pockets of air saturated with water.⁶⁷ As the evaporation rate slows to less than the rate of condensation, droplets can grow into full water droplets.⁶⁸ Condensation then takes the form of precipitation (rain, snow,

57. *See infra* Parts I–II.

58. *See infra* Parts II.

59. The reference here is to the interconnectedness of the water, in all of its forms, within the geographical boundaries of the United States, not WOTUS, as defined by the Clean Water Rule, which concededly fragments the natural water system. This fragmentation is explained in Part II of this Article.

60. *Understanding Earth: What's Up With Precipitation?*, NAT'L AERONAUTICS & SPACE ADMIN., https://pmm.nasa.gov/education/sites/default/files/document_files/NASA%20Understanding%20Earth%20-%20Whats%20Up%20With%20Precipitation.pdf (last visited Dec. 27, 2019).

61. *A Comprehensive Study of the Natural Water Cycle*, USGS, https://www.usgs.gov/special-topic/water-science-school/science/a-comprehensive-study-natural-water-cycle?qt-science_center_objects=0#qt-science_center_objects (last visited Dec. 27, 2019).

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.*

66. *Id.*

67. *Id.*

68. *Id.*

sleet, and hail).⁶⁹ Once precipitation reaches the ground, it takes on its terrestrial form, becoming groundwater, wetlands, and surface water.⁷⁰

Surface waters are visible riparian bodies, such as lakes, rivers, and streams, as well as the water that travels through the upper layers of unsaturated soil, just above the water table.⁷¹ Infiltration refers to the precipitation that percolates downward into the soil and into the water table and deeper groundwater aquifers.⁷² The subsurface flow of groundwater moves through the soil, drawn by gravity and capillary action.⁷³ Subsurface flow can reenter surface waters or can enter the water table, which is the section of porous materials (sand, silt, and clay) that is permanently saturated by water.⁷⁴ This is the area from which many water utilities, homeowners associations, industries, and farms access water by constructing wells.⁷⁵ Water may continue to flow below the water table and into aquifers, which are deep pockets of groundwater below bedrock that may be stored for centuries or millennia.⁷⁶

Vegetation plays a major role in the water cycle.⁷⁷ Terrestrial water can evaporate directly from the soil and other porous surfaces or by plant respiration.⁷⁸ Plants release water vapor from the tiny openings in their leaves.⁷⁹ Some groundwater is absorbed by plants and trees through their roots.⁸⁰ The evapotranspiration of water from the leaves creates an upward pressure that enables the tree to draw water from the roots and up into branches like a straw, which hydrates the tree and regulates its temperature.⁸¹ “A single, large tree can capture and filter [over 35,000] gallons of water per

69. *Id.*

70. *Id.*

71. *Id.*

72. *Id.*

73. *Forces Controlling Water in Rocks*, NAT'L GROUNDWATER ASS'N, <https://www.ngwa.org/what-is-groundwater/About-groundwater/forces-controlling-water-in-rocks> (last visited Dec. 27, 2019).

74. *See Groundwater*, N.Y. STATE DEP'T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/lands/36064.html> (last visited Dec. 27, 2019) (discussing the path that precipitation takes to become groundwater).

75. *Groundwater Wells*, USGS WATER SCI. SCH., https://www.usgs.gov/special-topic/water-science-school/science/groundwater-wells?qt-science_center_objects=0#qt-science_center_objects (last visited Dec. 27, 2019).

76. *A Comprehensive Study of the Natural Water Cycle*, *supra* note 61.

77. *See Evapotranspiration and the Water Cycle*, USGS WATER SCI. SCH., <https://water.usgs.gov/edu/watercycleevapotranspiration.html> (last visited Dec. 27, 2019) (discussing vegetation in the context of transpiration).

78. *Id.*

79. *A Comprehensive Study of the Natural Water Cycle*, *supra* note 61.

80. *Id.*

81. *See id.* (discussing the functions and process of plant transpiration).

year.”⁸² The positive contribution to the water supply of vegetative evapotranspiration is tremendous.⁸³

The confluence of these water features form watersheds.⁸⁴ The U.S. Geological Survey explains that “[a] watershed is an area of land that drains all the streams and rainfall to a [single] outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel.”⁸⁵ Because reservoirs and streams are an appropriate reference, they often create the local or regional context for discussing strategies to protect the quality and quantity of drinking water sources.⁸⁶ Viewed more broadly, these “local” watersheds are often part of larger jurisdictions; the interconnectivity of all water means that conflicts can arise from seemingly distant and unrelated actions.⁸⁷

B. Land Use and Development—Impacts on Water Quality

This elementary description of the water cycle should guide the formulation of land use strategies and water quality policy by governmental agencies.⁸⁸ It makes clear that the protection of groundwater and surface waters calls upon municipalities with the authority to regulate private development to adopt land use regulations that protect water quality in local watersheds, in concert with neighboring communities, regional bodies, and state and federal agencies that govern and can affect the larger, interconnected watersheds.⁸⁹ The effect of land use and development on water quality is examined below in three categories: the impact on surface waters, sedimentation and eutrophication, and environmental impact on soils.⁹⁰

82. *Land for Clean Water*, OPEN SPACE INST., <https://www.openspaceinstitute.org/what/land-for-clean-water> (last visited Dec. 27, 2019).

83. *A Comprehensive Study of the Natural Water Cycle*, *supra* note 61.

84. *Watersheds and Drainage Basins*, USGS WATER SCI. SCH., https://www.usgs.gov/special-topic/water-science-school/science/watersheds-and-drainage-basins?qt-science_center_objects=0#qt-science_center_objects (last visited Dec. 27, 2019).

85. *Id.*

86. *See infra* Part III.

87. *See The Hydrologic Cycle*, IDAHO STATE UNIV., <https://digitalatlas.cose.isu.edu/hydr/basics/main/wtrcycl.htm> (last visited Dec. 27, 2019) (discussing some of the conflicts that can arise due to the interconnectivity of water).

88. *See supra* Part I.A.

89. *See infra* Parts III–IV.

90. *See infra* notes 91–134 and accompanying text.

1. Surface Water Impacts from Poor Development Practices

Urban development changes the characteristics of surface waters leading to what some water resource managers call the “urban stream syndrome”—the complex but consistent pattern of degradation of urban streams relative to their undeveloped . . . counterparts.”⁹¹ Pavement, rooftops, and compacted soils play the most important role in the urban stream degradation because these surfaces prevent water from naturally percolating into the ground.⁹² Residential developments and commercial land uses, common in urban development, effectively result in the construction of impervious surfaces on approximately 44% to 72% of the urban landscape.⁹³ Worrisome stream degradation begins after more than 10% of a watershed is covered with these impervious surfaces.⁹⁴

Impervious surfaces also change runoff patterns, which affect stream hydrology.⁹⁵ Urban streams are adversely affected by increased flood-level flows from storm events.⁹⁶ More flooding changes the stream bed and bank, deepening and eroding each, respectively.⁹⁷ Bank erosion is particularly problematic in that it leads to increased sediment loading in the stream.⁹⁸ Runoff traveling across impervious surfaces collects trash, oils, sediments, fertilizers, bacteria, and road treatment products.⁹⁹ This polluted runoff flows directly into streams, unless collected and treated by storm and sanitary sewer systems.¹⁰⁰

91. SHIMON C. ANISFELD, WATER RESOURCES 154 (2010) (citation omitted).

92. *See id.* (emphasis omitted) (“Most of the impacts of urbanization stem from the presence of impervious surfaces . . . that cannot absorb water, such as a building, road, parking lot, or driveway.”).

93. *Id.* at 155.

94. *Id.*

95. *See id.* at 157 (explaining how urbanization and impervious surfaces create faster and flashier stormflow which creates rapid runoff of precipitation, which in turns leads to “less recharge of the groundwater that sustains baseflow”).

96. *See id.* at 156 (mentioning that urbanization increases flooding, and “[u]rban streams are uniformly ‘flashier’ than their underdeveloped counterparts, with a quicker and higher stormflow peak and a more rapid return to baseflow”).

97. *See id.* at 157 (“The increased frequency of high flows in urban watersheds can lead to deepening and/or widening of the stream channel, as the high water velocities scour the stream bed and banks.”).

98. *See id.* (adding that mismanaged land clearing in urbanizing watersheds could create unusually high erosion in the watershed that deposits sediment).

99. *See id.* (describing how rain flows from urbanization usually “pick up pollutants from the land surface and carry them to the nearest stream” and giving a list of examples of pollutants).

100. *See id.* (concluding that urbanization leads to an increase in pollutants and a redirection of water flow, minimizing the chance that pollutants will be removed through soil).

2. Sediment Pollution and Cultural Eutrophication

Domestically, sediment pollution is the greatest threat to water quality.¹⁰¹ It occurs when soil erodes, that is, when particles become detached from the ground and flow into streams.¹⁰² Many factors affect soil erosion, including its texture, type, and structure; the vegetative cover; topographical features, particularly slope; climatic factors, such as wind, temperature, and rainfall; and the velocity of water runoff.¹⁰³ Land development practices and land use change directly impact the amount of sediment runoff because they alter the cover, grade, and structure of soils.¹⁰⁴ The EPA estimates that human activities cause 70% of sediment pollution.¹⁰⁵

Understanding the negative impacts of high sediment pollution due to land development highlights why land use regulations are needed to mitigate erosion and increase water quality.¹⁰⁶ Filling a stream with dirt causes problems ranging from covering up bottom organisms' homes to depriving water plants of needed nutrients.¹⁰⁷ Sediment pollution leads to physical, biological, and chemical impacts.¹⁰⁸ Physical impacts include making surface waters shallower, impacting navigation, storage capacity, and water temperature.¹⁰⁹ Turbid water clogs the filtering function of water plants, increasing the cost of providing drinking water.¹¹⁰ Biological impacts include burying organisms and plants, clogging fish gills, and increasing algae growth.¹¹¹ Chemical impacts include reducing light energy and nutrient transport.¹¹²

Nutrients attach to the soil particles and wash into the surface waters.¹¹³ Sediment particles carry the nutrients, such as nitrogen and phosphorus,

101. See U.S. ENVTL. PROT. AGENCY, EPA 841-F-05-001, PROTECTING WATER QUALITY FROM AGRICULTURAL RUNOFF (2015) [hereinafter U.S. ENVTL. PROT. AGENCY, PROTECTING WATER QUALITY], https://www.epa.gov/sites/production/files/2015-09/documents/ag_runoff_fact_sheet.pdf (defining the most prevalent source of agricultural water pollution).

102. CONN. DEP'T OF ENVTL. PROT., 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, 2-1 (2002), https://www.ct.gov/deep/lib/deep/water_inland/sesc/seccs_chapter_1_5.pdf.

103. *Id.* at 2-4.

104. *Id.* at 2-7.

105. *What is Sediment Pollution?*, *supra* note 12.

106. See *infra* notes 107–12 and accompanying text.

107. See generally U.S. ENVTL. PROT. AGENCY, PROTECTING WATER QUALITY, *supra* note 101 (discussing some of the negative impacts associated with agricultural runoff).

108. *Id.*

109. CONN. DEP'T OF ENVTL. PROT., *supra* note 102, at 2-7.

110. See generally U.S. ENVTL. PROT. AGENCY, PROTECTING WATER QUALITY, *supra* note 101 (discussing how turbid water can kill aquatic vegetation and increase costs).

111. *Id.*

112. CONN. DEP'T OF ENVTL. PROT., *supra* note 102, at 2-7.

113. J. DAVID ALLAN & MARIA M. CASTILLO, STREAM ECOLOGY 255 (2d ed. 2007).

needed to grow plants.¹¹⁴ Eutrophication is the process by which water becomes overly saturated with these nutrients.¹¹⁵ Cultural eutrophication is when human activity increases the rate of this process.¹¹⁶ The result is intense plant growth such as algal blooms.¹¹⁷ When these plants die, decomposer organisms use oxygen as they consume dead plant matter.¹¹⁸ Because excess nutrients enable more plant growth, there is more food for the decomposers.¹¹⁹ More food leads to more consumption as more oxygen is consumed.¹²⁰ As the decomposers use up the available dissolved oxygen, the larger organisms, such as fish, essentially suffocate.¹²¹ Dead fish provide more food for the decomposers.¹²² This creates hypoxic, or dead zones, which can greatly reduce biodiversity.¹²³

In some cases, the algal blooms can also include dangerous cyanobacteria.¹²⁴ Cyanobacteria, also known as blue-green algae, is harmful to humans and can be lethal to some animals, including dogs.¹²⁵ “[T]he toxins in blue-green algae can cause severe neurological symptoms [in canines] that can lead to death within a couple of hours.”¹²⁶ Toxic blooms seem to be on the rise and, without proper management, pose a significant health risk.¹²⁷

3. Environmental Impacts to Soil Structures Due to Construction

Construction changes a normal soil system resulting in different alkalinity or acidity, high compaction, and removal of the soil’s mineral

114. *Id.*

115. S.R. CARPENTER ET AL., NONPOINT POLLUTION OF SURFACE WATERS WITH PHOSPHORUS AND NITROGEN 560 (1998).

116. *See Criteria Development Guidance for Wetlands Executive Summary*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/nutrient-policy-data/criteria-development-guidance-wetlands-executive-summary> (last updated Sept. 11, 2018) (defining cultural eutrophication).

117. S.R. CARPENTER ET AL., *supra* note 115, at 561.

118. *Id.*

119. *Id.*

120. *See id.* (discussing the connection between increased aquatic plant growth and hypoxia).

121. *Id.*

122. *Id.*

123. *Id.*

124. *See* Lisa W. Foderaro, *Beware the Blooms: Toxic Algae Found in Some City Ponds*, N.Y. TIMES (July 7, 2017) <https://www.nytimes.com/2017/07/07/nyregion/beware-the-blooms-toxic-algae-found-in-some-city-ponds.html> (reporting on the link between algal blooms and the city’s municipal water supply).

125. *See id.* (explaining that certain types of algae can be lethal to dogs).

126. *See id.* (quoting Dr. Vanessa Hammer, who explained how toxins in blue-green algae cause severe neurological symptoms that can be fatal).

127. *See id.* (discussing the rise in algal blooms in recent years).

layer.¹²⁸ Removal of organic layers changes the pH of the soil, which creates an unnaturally high or low pH soil depending on the construction-induced mixing.¹²⁹ The movement of large equipment during construction compacts the soil, which “crushes soil structure, impeding air, water, and root movement.”¹³⁰ Machinery flattens pore spaces between the soil particles.¹³¹ Compacted soils are, essentially, impervious surfaces that reduce recharge to groundwater aquifers.¹³² Compaction also closes organic pore spaces in soils, which builds up root-generated CO₂, slowing root respiration and plant growth.¹³³ Grading of soils during construction also removes organic layers, leaving only the lower soil horizons, which tend to be more clay-like, impervious, and lower in nutrients.¹³⁴

II. WATERS OF THE UNITED STATES—GAPS IN GOVERNMENTAL JURISDICTION¹³⁵

The legal definition of Waters of the United States under the Clean Water Act (CWA) is quite different from the scientific definition of the water system discussed above.¹³⁶ The sources of drinking water in the Sawkill Watershed, where Margaret’s community is located, are both groundwater aquifers and surface waters.¹³⁷ Both are fed and protected by wetlands of a variety of sizes and types.¹³⁸ Rain and snow contribute volume to each water source: stormwater and melting snow can either percolate into the aquifers

128. See WILLIAM ELMENDORF, UNDERSTANDING TREE PLANTING IN CONSTRUCTION-DAMAGED SOILS 3 (2017), <https://extension.psu.edu/understanding-tree-planting-in-construction-damaged-soils> (explaining that grading from commercial and residential construction mixes soils that can change in “fertility, pH, compaction, and drainage from foot to foot”).

129. See *id.* (noting soils that are made by grading from construction can result in unusually high or low pH levels from compaction and mixing crushed layers of soil).

130. See *id.* (“Compaction by people or equipment crushes soil structure, impeding air, water, and root movement.”).

131. See *id.* at 6 (explaining soil structure that has been compacted from construction becomes less porous and becomes layered).

132. See *id.* (discussing the impact of compacted soils on water movement).

133. See *id.* (noting that limited pore space due to compaction leads to poor gas levels and a respiration buildup of CO₂ in the soil, which in turn slows plant growth).

134. See *id.* at 3–4 (detailing how organic soil layers are stripped in the process of construction grading to expose compacted soils such as clay, which binds water and nutrients, making them unavailable to plant roots).

135. The author gratefully acknowledges the contributions to this Part made by Kathrine Klaus as a member of the research team. She is a joint degree student at Yale in the School of Forestry and Environmental Studies from Vermont Law School.

136. See *supra* Part I.

137. See generally *The Hydrologic Cycle*, *supra* note 87 (describing the hydrologic cycle).

138. See *id.* (describing the movement of water from wetlands to groundwater and surface waters).

or run into surface waters.¹³⁹ That precipitation is fed, in turn, by the evaporation of water from the surface.¹⁴⁰ The connections here are obvious and the workings of these waters are well understood by scientists.¹⁴¹

It is now 158 years since the Ohio court in the *Frazier* decision criticized the occult nature of water science.¹⁴² During that time, science has clarified the movements of water and sharpened the focus of courts and legislatures intent on protecting them.¹⁴³ We have fallen far short, however, of the task of aligning law with hydrologic fact.¹⁴⁴ The fundamental scientific fact of hydrology is the connectivity among types and sources of water.¹⁴⁵ Regulation of water pollution, however, is a patchwork of mostly unconnected regimes.¹⁴⁶ At the federal level, the law is particularly fragmented.¹⁴⁷ Under the CWA, for example, the federal government has authority over “navigable waters,” while the states govern all other waters.¹⁴⁸

A. Waters of the United States

Congress enacted the CWA pursuant to its authority to regulate interstate commerce under the Commerce Clause of the Constitution.¹⁴⁹ Congress has the authority “[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes.”¹⁵⁰ This includes authority over channels of interstate commerce, including “navigable rivers, lakes, and

139. *Id.*

140. *See id.* (“Water at the surface (wetlands, lakes, rivers, oceans) evaporates into the atmosphere, leaving impurities behind.”).

141. *See generally id.* (outlining the hydrologic cycle).

142. *See Frazier v. Brown*, 12 Ohio St. 294, 311 (1861) (opining that any attempt to set legal rules for water “would be involved in hopeless uncertainty, and would be, therefore, practically impossible”).

143. *See, e.g.*, John R. Nolon, *Historical Overview of the American Land Use System: A Diagnostic Approach to Evaluating Governmental Land Use Control*, 23 PACE ENVTL. L. REV. 821, 832 (2006) [hereinafter Nolon, *Historical Overview of the American Land Use System*] (discussing the push to legislate against water pollution beginning in the 1970s).

144. *See, e.g., infra* notes 223–26 and accompanying text (describing some of the limitations of federal water regulation).

145. *See generally The Hydrologic Cycle, supra* note 87 (describing the hydrologic cycle).

146. *See, e.g., infra* Parts II.A–B (discussing both federal and state roles in water regulation).

147. *See, e.g., infra* note 148 and accompanying text (providing an example of the fragmentation of water regulation in the United States).

148. *Compare* 33 U.S.C. § 1311(a) (2012) (prohibiting the discharge of pollutants except in compliance with sections of the CWA), *and* 33 U.S.C. § 1362(12) (2012) (defining “discharge” as “any addition of any pollutant to navigable waters from any point source”), *with* *Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Eng’rs*, 531 U.S. 159, 174 (2001) (citation omitted) (noting that the states have “traditional and primary power over land and water use”).

149. *United States v. Deaton*, 332 F.3d 698, 706 (4th Cir. 2003).

150. U.S. CONST. art. I, § 8, cl. 3.

canals of the United States.”¹⁵¹ Traditionally navigable waters are those that “are used, or are susceptible of being used, in their ordinary condition, as highways for commerce,” as well as those subject to “the ebb and flow of the tide.”¹⁵² Included here, of course, are the “navigable rivers, lakes, and canals of the United States.”¹⁵³ The Commerce Clause gives federal agencies power over activities substantially related to interstate commerce.¹⁵⁴ For example, Congress has the power to regulate non-navigable tributaries of navigable waters in order to protect downstream quality.¹⁵⁵ Furthermore, activities that are entirely intrastate can have aggregate impacts on interstate commerce that bring them within Commerce Clause jurisdiction.¹⁵⁶

The limits on Congress’s authority under the Commerce Clause constrain CWA jurisdiction; the Act can only go as far as the Constitution allows.¹⁵⁷ As the Supreme Court explained, the reach of Commerce Clause authority “must be considered in the light of our dual system of government” and cannot swallow the line between what is federal and what is truly local.¹⁵⁸ In this way, authority over waters is fragmented, and, in many contexts, states have the sole power to implement protective regulations directly or by delegating that authority to their local governments.¹⁵⁹

This federalism structure is a hallmark characteristic of the CWA.¹⁶⁰ It is meant to respect states’ traditional jurisdiction over their property.¹⁶¹ The Act states that, “[i]t is the policy of the Congress to recognize, preserve, and protect the primary responsibilities and rights of States.”¹⁶² The federal government therefore has limited jurisdiction over water pollution and leaves

151. *Gibbs v. Babbitt*, 214 F.3d 483, 490 (4th Cir. 2000) (quoting *United States v. Miles*, 122 F.3d 235, 245 (5th Cir. 1997) (DeMoss, J., concurring)).

152. *The Daniel Ball*, 77 U.S. 557, 557, 563 (1870).

153. *Gibbs*, 214 F.3d at 490 (quoting *Miles*, 122 F.3d at 245).

154. *See United States v. Ashland Oil & Transp. Co.*, 504 F.2d 1317, 1328 (6th Cir. 1974) (discussing how water pollution is subject to congressional restraint because it affects commerce).

155. *Id.*

156. *See Wickard v. Filburn*, 317 U.S. 111, 128–29 (1942) (discussing how growing and consuming wheat on a farm can influence commodity prices, thereby defeating the purpose of federal regulation).

157. *See United States v. Holland*, 373 F. Supp. 665, 671 (M.D. Fla. 1974) (citations omitted) (analogizing the court’s finding that the CWA had no limiting language in the definition of “waters of the United States,” and as a result “the sole limitation on the reach of federal power [under the CWA] would be the commerce clause”).

158. *N.L.R.B. v. Jones & Laughlin Steel Corp.*, 301 U.S. 1, 37 (1937).

159. *See, e.g., infra* notes 223–26 and accompanying text (describing the balance of power between local, state, and federal governments over water regulation).

160. *See U.S. Dep’t of Energy v. Ohio*, 503 U.S. 607, 633 (1992) (“[T]he [CWA] establishes a distinctive variety of cooperative federalism.”).

161. 33 U.S.C. § 1251(b) (2012).

162. *Id.*

much regulation to the states and their municipalities.¹⁶³ If the interconnected groundwater, wetlands, and surface waters in watersheds are to be properly protected, state and local governments must implement their own laws addressing water pollution.¹⁶⁴

1. Surface Water

The CWA does not clearly define what surface waters are subject to federal jurisdiction, so-called “jurisdictional waters.”¹⁶⁵ The Act simply states that the federal government regulates “navigable waters,” which are statutorily defined as “waters of the United States.”¹⁶⁶ Congress did not define this term further, but rather left its meaning to the EPA and the U.S. Army Corps of Engineers.¹⁶⁷ The EPA and the Corps have attempted to provide clarity by promulgating definitions of Waters of the United States, or WOTUS.¹⁶⁸ The first regulatory definition appeared in 1977 and created four categories of jurisdictional waters: (1) “[c]oastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including adjacent wetlands,” (2) “[t]ributaries to navigable waters,” (3) “[i]nterstate waters and their tributaries,” and (4) “[a]ll other waters of the United States . . . the degradation or destruction of which could affect interstate commerce.”¹⁶⁹ Three years later, in 1980, a new, similar definition was written that included traditionally navigable waters, interstate waters, the territorial seas, waters that could affect interstate or foreign commerce, impoundments of waters of the United States, tributaries of waters of the United States, and wetlands adjacent to waters of the United States.¹⁷⁰ This rule determined the definition of WOTUS for the next several decades.¹⁷¹

163. *See, e.g.*, *Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Eng’rs*, 531 U.S. 159, 173 (2001) (holding that the CWA does not reach “nonnavigable, isolated, intrastate waters” because such extensive jurisdiction would “encroach[] upon a traditional state power”).

164. *See* 33 U.S.C. § 1251(b) (recognizing that states have “the primary responsibilities and rights” over water resources).

165. *See id.* § 1362(7) (defining “navigable waters” as “waters of the United States,” but failing to define “waters of the United States”).

166. *Id.*

167. *See id.* (failing to define “waters of the United States”).

168. *See infra* notes 169–93 and accompanying text.

169. *Regulatory Programs of the Corps of Engineers*, 42 Fed. Reg. 37,122, 37,127 (July 19, 1977).

170. *See Consolidated Permit Regulations: RCRA Hazardous Waste; SDWA Underground Injection Control; CWA National Pollutant Discharge Elimination System; CWA Section 404 Dredge or Fill Programs; and CAA Prevention of Significant Deterioration*, 45 Fed. Reg. 33,290, 33,298 (May 19, 1980) (defining WOTUS).

171. STEPHEN P. MULLIGAN, CONG. RESEARCH SERV., R44585, EVOLUTION OF THE MEANING OF “WATERS OF THE UNITED STATES” IN THE CLEAN WATER ACT 12 (2016) (footnote omitted),

The rule was amended modestly thereafter, but versions promulgated in 1986 and 1988 were largely the same,¹⁷² and remained in place until 2015.¹⁷³

In 2015, the Obama Administration promulgated a new definition of WOTUS.¹⁷⁴ This rule, known as the Clean Water Rule, differed from the long-standing provision in two key ways: (1) it no longer included waters that could affect interstate commerce, and (2) it expanded jurisdiction to include waters with a significant nexus to other jurisdictional waters.¹⁷⁵ Thus, the 2015 Clean Water Rule both narrowed and broadened federal jurisdiction over water.¹⁷⁶ Much of this jurisdictional expansion encompassed wetlands.¹⁷⁷ Previously, wetlands were only covered if adjacent to a jurisdictional water.¹⁷⁸ Under the Obama formulation, wetlands were covered if they had a significant nexus to a jurisdictional water.¹⁷⁹ Therefore, wetlands no longer needed to touch jurisdictional waters.¹⁸⁰ Furthermore, wetlands within a watershed could be aggregated to reach the required significance.¹⁸¹ This broadening of the Act's jurisdiction led to significant controversy.¹⁸²

In 2017, President Trump signed an executive order requiring the EPA and the Corps to review the Clean Water Rule.¹⁸³ The agencies proposed to rescind the Rule and to replace it with a rule that narrows CWA

<https://fas.org/sgp/crs/misc/R44585.pdf> (“The two agencies continued to use [the 1980] definition (with modifications) until the Clean Water Rule was published in 2015.”).

172. *Compare* Consolidated Permit Regulations: RCRA Hazardous Waste; SDWA Underground Injection Control; CWA National Pollutant Discharge Elimination System; CWA Section 404 Dredge or Fill Programs; and CAA Prevention of Significant Deterioration, 45 Fed. Reg. at 33,298 (defining WOTUS as “much more than waters that are traditionally ‘navigable’”), *with* Final Rule for Regulatory Programs of the Corps of Engineers, 51 Fed. Reg. 41,206, 41,217 (Nov. 13, 1986) (making “two minor changes” to the definition of “[n]avigable [w]aters”), *and* Final Rule: Clean Water Act Section 404 Program Definitions and Permit Exemptions, 53 Fed. Reg. 20,764, 20,765 (June 6, 1988) (noting certain cases that should not be considered WOTUS).

173. *See* Clean Water Rule: Definition of “Waters of the United States”, 80 Fed. Reg. 37,054, 37,104 (June 29, 2015) (redefining WOTUS).

174. *Id.*

175. *Compare* Definitions, 40 C.F.R. § 230.3(o) (2015) (defining WOTUS as including waters that could affect interstate commerce), *with* Definitions, 40 C.F.R. § 230.3(s) (1986) (defining WOTUS as including all waters that are determined to have a significant nexus to other waters named by the previous subsections).

176. *See supra* notes 174–75 and accompanying text.

177. *See* Clean Water Rule: Definition of “Waters of the United States”, 80 Fed. Reg. at 37,104 (including “wetlands” in the definition of “[a]ll interstate waters”).

178. 40 C.F.R. § 230.3(s) (1986).

179. 40 C.F.R. § 230.3(o)(vii) (2015).

180. *Id.*

181. *Id.*

182. *See Nat’l Ass’n of Mfrs. v. Dep’t of Def.*, 138 S. Ct. 617, 624 (2018) (“The [Clean Water] Rule prompted several parties . . . to challenge the regulation in federal court.”).

183. Exec. Order 13,778, 82 Fed. Reg. 12,497, 12,497 (Feb. 28, 2017).

jurisdiction.¹⁸⁴ In February 2019, the agencies proposed a new rule redefining WOTUS.¹⁸⁵ The new definition includes traditionally navigable waters, their tributaries, and adjacent wetlands.¹⁸⁶ Furthermore, it states that wetlands are only considered “adjacent” if they abut a traditionally navigable water or have a “direct hydrologic surface connection” with a navigable water.¹⁸⁷ This change will substantially reduce the jurisdiction of the CWA.

Under the new rule, WOTUS will not include “[e]phemeral features,”¹⁸⁸ which “means surface water flowing or pooling only in direct response to precipitation (e.g., rain or snow fall).”¹⁸⁹ This exclusion will narrow CWA jurisdiction, especially in the West where many waters are impermanent.¹⁹⁰ For example, more than 90% of Arizona’s surface waters are ephemeral or intermittent.¹⁹¹ Furthermore, an EPA letter from 2006 estimated that “forty percent of point source discharges regulated under the CWA (excluding stormwater permits and non-stormwater general permits) come from intermittent, ephemeral, or very small perennial streams.”¹⁹² While some intermittent waters appear to be covered by the new rule, there is persuasive evidence that CWA jurisdiction will be significantly narrower under the new definition of “waters of the United States.”¹⁹³

184. *Compare* Recodification of Pre-Existing Rules, 82 Fed. Reg. 34,899, 34,900 (July 27, 2017) (defining “waters of the United States”), with Exec. Order 13,778, 82 Fed. Reg. at 12,497 (authorizing review of the WOTUS rule), and Revised Definition of “Waters of the United States”, 84 Fed. Reg. 4154, 4155 (proposed Feb. 14, 2019) (to be codified at 33 C.F.R. pt. 328 and 40 C.F.R. pts. 110, 112, 116, 117, 122, 230, 232, 300, 302 & 401) (proposing a new definition of WOTUS).

185. Revised Definition of “Waters of the United States”, 84 Fed. Reg. at 4154.

186. *Id.* at 4155.

187. *Id.*

188. *Id.* at 4173.

189. *Id.* at 4204.

190. See Darren Springer, *How States Can Help to Resolve the Rapanos/Carabell Dilemma*, 21 TUL. ENVTL. L.J. 83, 86 (2007) (discussing the large percentage of waters in the western U.S. that are intermittent and ephemeral).

191. *Id.* at n. 15 (citation omitted).

192. *Id.* at 91 (footnote omitted).

193. See Revised Definition of “Waters of the United States”, 84 Fed. Reg. at 4201, 4204 (emphasis in original) (“The term *tributary* means a river, stream, or similar naturally occurring surface water channel that contributes perennial or intermittent flow to a water [of the United States].”); *Report Details Impact on the Chesapeake Bay of Trump’s Proposed Rollback of Wetlands Regulations*, ENVTL. INTEGRITY PROJECT (Dec. 12, 2018), <https://www.environmentalintegrity.org/news/report-details-impact-on-the-chesapeake-bay-of-trumps-proposed-rollback-of-wetlands-regulations/> (claiming, under the 2015 Rule, these wetlands could qualify for CWA jurisdiction if they passed the significant nexus test); Definitions, 40 C.F.R. § 230.3(o)(vii)(A)–(E) (2015) (providing examples of wetlands with a “significant nexus to a water identified” under the 2015 rule, including the Delmarva peninsula). Under the new rule, however, at least 34,000 acres (about 54 square miles) of wetlands on the Delmarva peninsula in the Chesapeake Bay region will lose federal protection. *Report Details Impact on the Chesapeake Bay of Trump’s Proposed Rollback of Wetlands Regulations*, *supra*. According to the Environmental Integrity Project, about 38,000 miles of the region’s intermittent and ephemeral streams (over half of the region’s waterway mileage) will also fall outside CWA jurisdiction. *Id.*

2. Groundwater

Groundwater is specifically excluded from waters that are subject to federal jurisdiction.¹⁹⁴ The legislative history of the CWA indicates that Congress left groundwater regulation to the states “[b]ecause the jurisdiction regarding groundwaters is so complex and varied from State to State.”¹⁹⁵ Congress “did not intend to interfere with or displace the ‘complex and varied’ state jurisdictions over groundwaters.”¹⁹⁶

Some federal jurisdiction over discharges to groundwater may nevertheless exist.¹⁹⁷ In 2018, the Fourth and Ninth Circuits held that the scope of the CWA encompasses point source discharges directly into groundwater if it is hydrologically connected to federal jurisdictional surface waters.¹⁹⁸ The Sixth Circuit disagreed, holding that all discharges to groundwater are subject only to state jurisdiction.¹⁹⁹ Petitions for certiorari have been filed in the Fourth and Ninth Circuit cases.²⁰⁰ Furthermore, in 2018, the EPA issued a notice seeking comment on whether it has the authority to regulate discharges to tributary groundwater, and if so, whether the CWA is the appropriate statute by which to regulate them.²⁰¹

194. See 40 C.F.R. § 230.3(o)(2) (exempting groundwater from the definition of WOTUS); Revised Definition of “Waters of the United States”, 84 Fed. Reg. 4154, 4154 (proposed Feb. 14, 2019) (to be codified at 33 C.F.R. pt. 328 and 40 C.F.R. pts. 110, 112, 116, 117, 122, 230, 232, 300, 302 & 401) (exempting groundwater from the pre-proposal redefinition of WOTUS); see also *Wash. Wilderness Coal. v. Hecla Mining Co.*, 870 F. Supp. 983, 990 (E.D. Wash. 1994) (citations omitted) (finding that courts generally agree that the CWA “do[es] not include ‘isolated/nontributary groundwater’” but that courts are split on “whether tributary groundwater . . . is subject to CWA regulation”).

195. S. REP. NO. 92-414, at 73 (1971).

196. See *Exxon Corp. v. Train*, 554 F.2d 1310, 1326, 1329 (5th Cir. 1977) (explaining that the CWA “leave[s] control of groundwater pollution exclusively to the states”).

197. See *infra* notes 198–202 and accompanying text.

198. See *Haw. Wildlife Fund v. Cty. of Maui*, 886 F.3d 737, 749 (9th Cir. 2018) *petition for cert. filed* (U.S. Aug. 27, 2018) (No. 18-260), *cert. granted*, 139 S. Ct. 1164 (2019) (adopting a rule requiring a “fairly traceable” connection between groundwater and navigable waters under federal jurisdiction); see also *Upstate Forever v. Kinder Morgan Energy Partners*, 887 F.3d 637, 651 n.12 (4th Cir. 2018), *petition for cert. filed* (U.S. Aug. 28, 2018) (No. 18-268) (citation omitted) (arguing that the Ninth Circuit’s “fairly traceable” standard is functionally the same as adopting the “direct hydrological connection” rule).

199. See *Ky. Waterways All. v. Ky. Utilities Co.*, 905 F.3d 925, 938 (6th Cir. 2018) (rejecting federal jurisdiction over groundwater pollution, and, thus, leaving groundwater plaintiffs with no avenue for redress beyond that available through state mechanisms).

200. *Upstate Forever*, 887 F.3d at 651; *Haw. Wildlife Fund*, 886 F.3d at 749.

201. Clean Water Act Coverage of “Discharges of Pollutants” via a Direct Hydrologic Connection to Surface Water, 83 Fed. Reg. 7126, 7128 (Feb. 20, 2018) (to be codified at 40 C.F.R. pt. 122); see Ariel Wittenberg & Ellen M. Gilmer, *EPA Won’t Regulate Pollution that Moves Through Groundwater*, E&E NEWS (Apr. 16, 2019), <https://www.eenews.net/stories/1060169889> (noting that, in April of 2019, the EPA issued an interpretation of the CWA that does not cover indirect discharges through groundwater); Kathrine Klaus, *The Conduit Theory: Protecting Navigable Waters from Discharges to Tributary Groundwater*, 43 VT. L. REV. 871, 873 (2019) (footnote omitted) (“In February 2018, [the] EPA published

Accordingly, it is possible that the EPA or the Supreme Court could resolve this split and provide clarity on the scope of CWA jurisdiction in this developing area of the law. However, for the foreseeable future, there is no clear answer on this issue, and the regulation of discharges to tributary groundwater remains ambiguous.²⁰²

3. Nonpoint Source Pollution

In addition to omitting groundwater, the CWA does not regulate the largest contributor to water quality degradation: nonpoint source pollution.²⁰³ The Act only regulates discharges that stem from a “point source,” which the Act defines as “any discernible, confined and discrete conveyance.”²⁰⁴ The Act leaves nonpoint sources undefined, but the term is generally understood to occur when “rainfall or snowmelt moving over and through the ground[,] . . . picks up and carries away natural and human-made pollutants, . . . depositing them into lakes, rivers, wetlands, coastal waters and ground waters.”²⁰⁵ Some things held to be nonpoint sources include coal ash pits,²⁰⁶ human activity,²⁰⁷ and livestock.²⁰⁸

Congress elected not to focus federal regulation on nonpoint sources “in part because [they] were far more numerous and more technologically difficult to regulate.”²⁰⁹ Instead, the CWA leaves regulation of these diffuse discharges to the states and their local governments.²¹⁰ While the CWA has largely been successful in addressing point source pollution, the problem with nonpoint source pollution has become prominent.²¹¹ According to the

a notice seeking comment on . . . whether EPA has the authority to regulate discharges to tributary groundwater . . .”).

202. See *supra* notes 194–201 and accompanying text.

203. *Basic Information About Nonpoint Source (NPS) Pollution*, *supra* note 13.

204. 33 U.S.C. § 1362(14) (2012).

205. *Polluted Runoff: Nonpoint Source (NPS) Pollution*, U.S. ENVTL. PROT. AGENCY (Feb. 13, 2019), <https://www.epa.gov/nps>; see also *United States v. Earth Sci., Inc.*, 599 F.2d 368, 373 (10th Cir. 1979) (examining the legislative history surrounding the term “nonpoint source pollution”).

206. See *Sierra Club v. Virginia Elec. & Power Co.*, 903 F.3d 403, 410 (4th Cir. 2018) (holding that each of the Coal Ash Piles constitutes a point source, because they are discrete conveyances of pollutants discharged into surface waters).

207. *United States v. Plaza Health Labs., Inc.*, 3 F.3d 643, 651 (2d Cir. 1993).

208. *Oregon Nat. Desert Ass’n v. U.S. Forest Serv.*, 550 F.3d 778, 782 (9th Cir. 2008).

209. *Id.* at 780 (citing S. REP. NO. 92-414, at 39).

210. See *Introduction to the Clean Water Act*, *supra* note 15.

211. U.S. ENVTL. PROT. AGENCY, WATERSHED ACAD. WEB, INTRODUCTION TO THE CLEAN WATER ACT 4 [hereinafter U.S. ENVTL. PROT. AGENCY, INTRODUCTION TO THE CLEAN WATER ACT], <https://cfpub.epa.gov/watertrain/pdf/modules/introtoewa.pdf> (last visited Dec. 30, 2019).

EPA, the states have attested that degraded water quality now primarily stems from nonpoint sources.²¹²

The CWA's difficulty in addressing nonpoint source pollution is illustrated by a statutory tool called the "total maximum daily load" (TMDL).²¹³ When a water body is designated as impaired and cannot support its state-designated uses (e.g. drinking, fishing, recreational),²¹⁴ the CWA authorizes states to establish a TMDL for its designated impaired waters.²¹⁵ A TMDL sets a target for the total amount of various pollutants an entity can discharge into a waterbody.²¹⁶ Then, it divides this total between point and nonpoint sources (setting "wasteload allocations" and "load allocations," respectively).²¹⁷ In practice, TMDLs can reduce pollution in a waterbody, but are seldom effective.²¹⁸ TMDLs "function primarily as planning devices and are not self-executing."²¹⁹ TMDLs can be incorporated into federally- or state-required permits for point sources.²²⁰ However, they cannot be enforced against the originating sources of nonpoint degradation.²²¹ Therefore, although a TMDL initiative at the state level may set a limit on discharges for nonpoint sources, it may not lead to significant pollution reduction.²²²

212. *Basic Information About Nonpoint Source (NPS) Pollution*, *supra* note 13.

213. *See infra* notes 214–22 and accompanying text (describing the TMDL).

214. U.S. ENVTL. PROT. AGENCY, INTRODUCTION TO THE CLEAN WATER ACT, *supra* note 211, at 9.

215. *Id.* at 29.

216. *Id.* at 31.

217. Definitions, 40 C.F.R. § 130.2 (2018); Definitions, 40 C.F.R. § 130.7(c) (2001).

218. *See* U.S. ENVTL. PROT. AGENCY, EPA 841-R-11-003, FY2010 ASSESSMENT OF IMPROVEMENT AND RECOVERED WATERS WITH TOTAL MAXIMUM DAILY LOADS (TMDLS) (2011), <https://www.epa.gov/sites/production/files/2015-10/documents/tmdl-waters-improved.pdf> (showing that from 2002 to 2010, 3,832 waterbodies were "improved to the point that one or more of the original causes of impairment had been removed" due to TMDLs or TMDL alternatives).

219. *City of Arcadia v. U.S. Env'tl. Prot. Agency*, 265 F. Supp. 2d 1142, 1144 (N.D. Cal. 2003) (citation omitted).

220. Establishing Limitations, Standards, and Other Permit Conditions, 40 C.F.R. § 122.44(d)(1)(vii)(B) (2001).

221. *See* 33 U.S.C. § 1311 (2012) (prohibiting the discharge of pollutants); 33 U.S.C. § 1362 (2012) (defining the "discharge of a pollutant" as "any addition of any pollutant to navigable waters from any point source"); *see also City of Arcadia*, 265 F. Supp. 2d at 1145 ("For nonpoint sources, limitations on loadings are not subject to a federal nonpoint source permitting program, and therefore any nonpoint source reductions can be enforced against those responsible for the pollution only to the extent that a state institutes such reductions as regulatory requirements pursuant to state authority.").

222. *See* U.S. ENVTL. PROT. AGENCY, INTRODUCTION TO THE CLEAN WATER ACT, *supra* note 211, at 34 ("It is likely . . . that the CWA tools alone might not be sufficient to achieve needed reductions, especially in situations where nonpoint sources dominate loadings."). Although a separate and independent federal action, the EPA-directed Stormwater Management Program is effective in engaging local governments operating separate stormwater sewer systems to control nonpoint source pollution. *See infra* Part III.H (discussing the stormwater management program).

In summary, citizens like Margaret, who expect federal environmental laws, regulations, and agencies to protect them and their communities from water pollution, need to understand the CWA's considerable limitations. The government, by way of the CWA, has reduced the amount of surface water protected from point source pollution.²²³ Groundwater pollution is essentially unregulated by applicable CWA regulations.²²⁴ The largest source of water pollution—nonpoint source pollution—is outside its reach.²²⁵ Regulating these sources of water pollution is left to the states and their local governments.²²⁶ For this reason, local land use officials need to learn about the plenary power that the state and their own legislatures have to prevent and mitigate water pollution and protect public health.

B. State and Local Jurisdiction: Filling the Gaps

Historically, states have delegated their authority to regulate and mitigate the effects of land use to local governments.²²⁷ Along with that power, states give local governments the authority to tax land development and the responsibility to use their tax revenues to pay for the cost of municipal services.²²⁸ Those three powers are intertwined and create a state-wide system of law that permits and controls land development in the public interest, primarily through local lawmaking and administrative procedures.²²⁹

States give local governments broad and comprehensive control of urban development, human settlements, and land use projects.²³⁰ Local governments adopt comprehensive land use plans, zoning laws, subdivision and site plan regulations, and other land use laws.²³¹ The judiciary's traditional view was that state-delegated local authority is to be narrowly construed under the so-called Dillon's rule that most states have overruled,

223. See *supra* notes 174–87 and accompanying text (discussing recent changes to the Clean Water Act).

224. See *supra* notes 194–96 and accompanying text (noting exclusion of groundwater from federal jurisdiction).

225. See U.S. ENVTL. PROT. AGENCY, INTRODUCTION TO THE CLEAN WATER ACT, *supra* note 211 (discussing Congress's decision not to regulate nonpoint source pollution).

226. See *id.* (discussing section 319 of the Clean Water Act).

227. See Nolon, *Historical Overview of the American Land Use System*, *supra* note 143 at 821–22 (2006) (chronicling the push to legislate against water pollution beginning in the 1970s).

228. See generally Erin Adele Scharff, *Powerful Cities?: Limits on Municipal Taxing Authority and What to Do About Them*, 91 N.Y. UNIV. L. REV. 292, 295 (explaining how the powers of a municipality are limited to those granted under state law).

229. See Nolon, *Historical Overview of the American Land Use System*, *supra* note 143 at 848 (noting how these combined powers have allowed localities to adopt innovative and flexible land use regulations).

230. *Id.*

231. See *id.* at 847–48 (highlighting the powers granted to municipalities by states).

with respect to local land use authority, and replaced with a broader interpretation.²³² A recent trend of some state legislatures, to preempt local authority, has generally not touched on local power to protect natural resources.²³³

Part of Margaret's disappointment over the limitations of state agency authority was assuaged after she learned that this legal system prevails in all 50 states and principally relies on local governments and democratic processes to control land uses in order to protect the public health and ecosystems, including watersheds.²³⁴ The delegation of that power explains why state legislatures have not vested their state agencies with land use control so as not to compete with or hinder this traditional local jurisdiction.²³⁵ It also demonstrates why the opportunity—or responsibility—rests with local governments to fill the significant gaps in federal and state

232. See *Homebuilders Ass'n v. City of Charlotte*, 442 S.E.2d 45, 49–50 (N.C. 1994) (emphasis in original) (“It is the policy of the General Assembly that the cities of this State should have adequate authority to execute the powers, duties, privileges, and immunities conferred upon them by law. To this end, the provisions of this Chapter and of city charters shall be *broadly construed* and grants of power shall be construed to include *any additional and supplementary powers that are reasonably necessary or expedient to carry them into execution and effect . . .*”); *Barbulean v. City of Newburgh*, 168 Misc. 2d 728, 738–39 (N.Y. Sup. Ct. 1995) (“[T]he court recognizes that [t]he power of local governments to zone and control land use is undoubtedly broad and its proper exercise is an essential aspect of achieving a satisfactory quality of life in both urban and rural communities . . .” (citation omitted)); *City of Lewes v. Nepa*, No. S17A-06-003, 2019 LEXIS 293, at *3 (Del. June 10, 2019) (“The permissive nature of the statute makes it clear that the state statute sets a floor and not a ceiling for the City to honor.”); *Worley Highway Dist. v. Kootenai Cty.*, 663 P.2d 1135, 1137 (Idaho Ct. App. 1983) (“[I]n enacting the Local Planning Act of 1975, the legislature obviously intended to give local governing boards, such as the Kootenai County Commissioners, broad powers in the area of planning and zoning.”); *Southdown, Inc. v. Jackson Twp. Zoning Hearing Bd.*, 809 A.2d 1059, 1065 (Pa. Commw. Ct. 2002) (“Municipalities have broad authority to regulate land use in general and mineral extraction in particular.”); *Barr v. City of Sinton*, 295 S.W.3d 287, 297 (Tex. 2009) (citation omitted) (“The power of local governments to zone and control land use is undoubtedly broad and its proper exercise is an essential aspect of achieving a satisfactory quality of life in both urban and rural communities.”); see also ARKANSAS MUNICIPAL LEAGUE, GUIDEBOOK FOR MUNICIPAL OFFICIALS OF MAYOR/COUNCIL CITIES 1, 5 (Revised 2015), https://static.ark.org/eeuploads/arml/MayorCouncil_Guidebook_2015_WEB.pdf (explaining some state legislatures have explicitly repealed the applicability of Dillon’s Rule via statute in addition to the judicial interpretations); HON. JOHN D. RUSSELL & AARON BOSTROM, WHITE PAPER: FEDERALISM, DILLON RULE, AND HOME RULE, AMERICAN CITY COUNTY EXCHANGE 6 (2016) (explaining that some states have incorporated self-executing provisions related to home rule authority in their state constitutions).

233. See Richard C. Schragger, *Federalism, Metropolitanism, and the Problem of States*, 105 VA. L. REV. 1, 29 (2019) (explaining that some states have adopted laws that preempt municipal ability to pass any regulation related to entire areas of policy with the exception of local control over fracking in a few states; these areas do not include those related to land use and natural resource protection).

234. See John R. Nolon, *In Praise of Parochialism: The Advent of Local Environmental Law*, 26 HARV. ENVTL. L. REV. 365, 372–73 (2002) (discussing how local land use regulation is a tool for public health and how some localities have begun to regulate land use on a watershed level).

235. See e.g., *infra* notes 251–53 and accompanying text (discussing the fact that New York has not given state agencies the authority to regulate land development).

authority to regulate water quality.²³⁶ As we will see in Parts III and IV below, locals need and receive much assistance from state and federal agencies in this gap-filling role, but local power remains the foundation of the enterprise.²³⁷

1. State Police Power

The United States's dual system of federalism reserves to the states the powers that are not specifically delegated to the federal government by the Constitution.²³⁸ The Tenth Amendment acknowledges the Constitution's reservation of powers.²³⁹ The police power and other powers reserved to the states are not powers conferred upon the states, but ones that have always resided within their dominion.²⁴⁰ So, to the extent that the Commerce Clause limits federal power to control water pollution, the states retain jurisdiction under their sovereign police power.²⁴¹

Although difficulties in defining the police power have plagued both courts and scholars,²⁴² police power is generally understood by the legal

236. See *supra* notes 223–26 and accompanying text (discussing how local land use regulations help to fill the gaps in the CWA.)

237. See *infra* Parts III–IV.

238. See U.S. CONST. amend. X (“The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.”). See also James Madison, THE FEDERALIST NO. 39, at 186 (Terence Ball ed., 2003) (highlighting federal authority “extends to certain enumerated objects only, and leaves to the several States a residuary and inviolable sovereignty over all other objects”). “The powers delegated by the proposed Constitution to the federal government are few and defined. Those which are to remain in the State governments are numerous and indefinite The powers reserved to the several States will extend to all the objects which, in the ordinary course of affairs, concern the lives, liberties, and properties of the people, and the internal order, improvement, and prosperity of the State.” James Madison, FEDERALIST NO. 45, at 292–93 (C. Rossiter ed. 1961).

239. U.S. CONST. amend. X (“The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.”); see also Santiago Legarre, *The Historical Background of the Police Power*, 9 U. PA. J. CONST. L. 745, 778 (2007) (“[T]he [Tenth] Amendment functions as a principal constitutional basis of state police power.” (footnote omitted)).

240. See Brian W. Ohm, *Some Modern Day Musings on the Police Power*, 47 URB. LAW. 625, 626 (2015) (“The police power is *not*, as often cited, a power that is ‘conferred . . . by the Tenth Amendment, U.S. Const., upon the individual states.’ The Tenth Amendment did not confer anything on the states. Rather, in the United States, sovereignty resides with the people.” (footnotes omitted)); see also Nolon, *Historical Overview of the American Land Use System*, *supra* note 143 at 825 (“[The U.S. Constitution] created a federal government that has the power to legislate only within the parameters of the specific powers delegated to it in the Constitution. Notably, the full police powers of the states were not delegated to the federal government.”).

241. See *supra* notes 238–41 and accompanying text.

242. See, e.g., Walter Wheeler Cook, *What is the Police Power?*, 7 COLUM. L. REV. 322, 322 (1907) (“No phrase is more frequently used and at the same time less understood than [police power]”); Collins Denny, Jr., *The Growth and Development of the Police Power of the State*, 20

community as the power to protect the health, safety, and welfare of the public.²⁴³ Historically, courts equate police power with the state government's objective of securing the public welfare through regulatory means.²⁴⁴ The Supreme Court has held that the police power inherently lies within the authority of the states,²⁴⁵ and it is extremely broad, in that it encompasses a host of factors under the general term "public welfare."²⁴⁶ State supreme courts have likewise broadly interpreted the police power.²⁴⁷ The extent of the police power, however, seems to resist delineation, for it depends on shifting social, economic, and political winds.²⁴⁸

MICH. L. REV. 173, 173 (1921) ("[The] police power of the state is one of the most difficult phases of our law to understand, and it is even more difficult to define it and to place it within any bounds."); Legarre, *supra* note 239, at 747 (footnotes omitted) ("The police power suffers from a surprising problem. Though it has been in constant use for many years and has proved important in the vocabulary of American constitutional law[,] . . . [t]he meaning and implications of the term are far from clear. . .").

243. *Police Power*, BLACK'S LAW DICTIONARY (11th ed. 2019) (defining "police power" as "[t]he inherent and plenary power of a sovereign to make all laws necessary and proper to preserve the public security, order, health, morality, and justice").

244. See 4 WILLIAM BLACKSTONE, COMMENTARIES ON THE LAWS OF ENGLAND: PUBLIC WRONGS 162 (photo. Reprint 1979) (1765–69) (defining "police power" as "the due regulation and domestic order of the kingdom: whereby the individuals of a State, like members of a well governed family, are bound to conform their . . . behaviour to the rules of propriety, good neighbourhood, and good manners; and to be decent, industrious, and inoffensive in their respective stations."); ERNST FREUND, THE POLICE POWER, PUBLIC POLICY AND CONSTITUTIONAL RIGHTS 3 (1904) ("[I]t is possible to evolve at least two main attributes or characteristics which differentiate the police power: it aims to directly secure and promote the public welfare, and it does so by restraint and compulsion.").

245. See *Nebbia v. People of New York*, 291 U.S. 502, 524 (1934) (citation omitted) ("[W]hat are the police powers of a State? They are nothing more or less than the powers of government inherent in every sovereignty to the extent of its dominions.").

246. "Public safety, public health, morality, peace and quiet, law and order—these are some of the more conspicuous examples of the traditional application of the police power to municipal affairs. Yet they merely illustrate the scope of the power and do not delimit it . . . The concept of the public welfare is broad and inclusive . . . The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as healthy, spacious as well as clean, well-balanced as well as carefully patrolled." *Berman v. Parker*, 348 U.S. 26, 32–33 (1954) (citations omitted).

247. For example, the highest state court in New York explained that "[t]he [police] power is not limited to regulations designed to promote public health, public morals or public safety or to the suppression of what is offensive, disorderly or unsanitary but extends to so dealing with conditions which exist as to bring out of them the greatest welfare of the people by promoting public convenience or general prosperity." *Wulfsohn v. Burden*, 150 N.E. 120, 122 (N.Y. 1925) (citation omitted). See also *Spann v. City of Dallas*, 235 S.W. 513, 515 (Tex. 1921) ("The police power is a grant of authority from the people to their governmental agents for the protection of the health, the safety, the comfort and the welfare of the public. In its nature it is broad and comprehensive."); *Ohm*, *supra* note 240, at 626 ("As summarized in this article, the police power is extremely broad.").

248. "[I]t is only by a detailed examination of statutes and decisions that the [police] power can be fully understood and defined." Such an examination will "reveal the police power not as a fixed quantity, but as the expression of social, economic and political conditions. As long as these conditions vary, the police power must continue to be elastic . . ." FREUND, *supra* note 244, at 3.

Using their reserved police power, state legislatures could give the power to regulate land development and mitigate its adverse impacts on water quality to state agencies. State legislation in most states, including New York, however, does not give state agencies authority to regulate land development that contribute to groundwater contamination and nonpoint source pollution.²⁴⁹ The New York model, perhaps more aggressive in creating and empowering water-related state agencies than most states, demonstrates the statutory limits of state agencies to control the sources of water pollution and watershed degradation.²⁵⁰

The New York Department of Health (DoH), for example, has the statutory authority to regulate the operation and design of private and some public groundwater wells.²⁵¹ This is done in partnership with the EPA.²⁵² Such wells must meet DoH-established water quality standards, but failure to meet them simply defeats the well permit application; it does not give the DoH the authority to prevent water pollution through land use regulation or other means.²⁵³

The DoH does prevent water pollution by establishing requirements for small residential Onsite Wastewater Treatment Systems (OWTS) and through a permitting system.²⁵⁴ OWTS facilities must be designed to meet DoH water quality standards.²⁵⁵ Its authority to manage this permitting function, however, does not give the state agency authority to limit, shape, or

249. See N.Y. ENVTL. CONSERV. LAW § 15-1501 (McKinney 2012) (setting forth strict measures as to what the DEC can govern in terms of water sources, which do not include land development that has caused groundwater contamination and other types of water pollution).

250. See *id.* (authorizing the DEC to govern allocation of limited water sources among users under the state's Water Resources Law, *id.* § 15-1101, which authorizes the DEC to undertake comprehensive planning for the protection, conservation, and beneficial utilization of the water resources of the state). See *id.* § 15-2709 (managing and protecting certain "wild, scenic, and recreational rivers" which can affect the scope of local land use regulations under a little-used provision of state law). Article 11, section 1100 of the Public Health Law allows the DoH to issue watershed rules and regulations, which can unite upstream and downstream municipalities in collaborative efforts to limit contamination of downstream public water supplies. N.Y. PUB. HEALTH § 1100 (McKinney 2012).

251. N.Y. PUB. HEALTH § 1100.

252. See 42 U.S.C. § 300g-1 (1996) (highlighting under the Safe Drinking Water Act the EPA must establish maximum levels for contamination to protect public health); see also *id.* § 300g-2 (noting that states may enforce standards that are no less stringent than those of the EPA).

253. N.Y. ENVTL. CONSERV. LAW § 15-1501.

254. N.Y. COMP. CODES R. & REGS. tit. 10, § 75-A (2016). See also N.Y. COMP. CODES R. & REGS. tit. 6, § 750-2.10 (2003) (giving the Department of Environmental Conservation authority to create design standards for residential wastewater systems with flows of over 1,000 gpd and other private, commercial, and institutional systems).

255. N.Y. COMP. CODES R. & REGS. tit. 10, § 75-A. (applying the appendix of DoH standards to residential onsite systems receiving sewage "without the admixture of industrial wastes or other wastes, as defined in Environmental Conservation Law, Section 17-0701").

prevent land development on private property.²⁵⁶ It does not reach the issue of nonpoint source pollution.²⁵⁷

State statutes in New York give the Department of Environmental Conservation (DEC) primary authority for comprehensive management of the state's water resources.²⁵⁸ The DEC also collaborates with the EPA to identify and list waterbodies that qualify as "impaired . . . waters" under section 303(d) of the CWA.²⁵⁹ The Act encourages states to classify such waters and develop TMDLs of a large number of contaminants for impaired water bodies.²⁶⁰ The DEC has developed an elaborate system for classifying waterbodies in the state by best uses, but the lack of enforcement and penalties for failing to meet TMDL standards renders this federal-state initiative relatively impotent concerning land use regulation and nonpoint source pollution prevention.²⁶¹

III. THE POLICE POWER IN PRACTICE: LOCAL SOLUTIONS

A. Local Government Initiatives

Many local governments understand that they need to use their delegated land use authority to respond to threats to their water bodies and watersheds.²⁶² This Part describes a number of traditional land use techniques and several innovative measures municipalities use to protect and conserve water.²⁶³ Included are land use plan components, zoning provisions, site plan

256. *See id.* § 75-A.2(a)–(d) (outlining the state's jurisdiction over sewage treatment systems as only those that are located "on the watersheds or well head area of public water supplies[,] . . . on the watershed of any stream or body of water from which the City of New York obtains its water supply[,] . . . [and] [w]hen individual sewage systems overlay a drinking water aquifer").

257. *See id.* (making no mention of DEC water quality standards to control impairment from nonpoint source pollution).

258. *See* N.Y. ENVTL. CONSERV. LAW § 15-2907 (McKinney 1984) (giving the DEC primary responsibility for comprehensive management of the state's water resources, including establishing a permit system for private user water withdrawals from wells and surface waters).

259. U.S. ENVTL. PROT. AGENCY, INTRODUCTION TO THE CLEAN WATER ACT, *supra* note 211, at 26.

260. *Id.* at 25.

261. *Id.* at 23.

262. *See infra* Part III.

263. Not included in this Part is comprehensive treatment of the methods that local governments use to regulate settlement patterns to conserve and protect water indirectly by shaping settlement patterns: strategies referred to as smart growth, sustainable development, or, more recently, climate change mitigation and adaption, all of which tend to increase water conservation and protect its quality. For an example of the water-conserving potential of sustainable development, see John R. Nolon, *Low Carbon Land Use: Paris, Pittsburgh, and the IPCC*, 40 U.A. LITTLE ROCK L. REV., 661, 692 (2018) [hereinafter Nolon, *Low Carbon Land Use*] ("As a sustainable development . . . Hudson Park . . . reduced average per household impervious coverage by 96%, lowered per capita water use by 60%, and avoided disrupting

regulations, water conserving landscape and building features, water supply permits, public nuisance laws, well testing, and stormwater remediation fees.²⁶⁴ These examples are models other localities can adopt and illustrate the wide range of actions that they can adopt by analogy.²⁶⁵ They demonstrate how local governments can fill the gaps in state and federal regulations to create a more holistic system of water protection.²⁶⁶ These laws, and their many counterparts, are part of our national system of water law.²⁶⁷

B. Comprehensive and Topical Land Use Plans

Comprehensive and topical land use plans establish goals for land use planning and define strategies to achieve those goals.²⁶⁸ They are not regulatory, but guide the adoption of zoning and other land use regulations.²⁶⁹ Plans require citizen participation, which educates the public and secures strategic support for their goals and proposed implementation measures.²⁷⁰ The process of framing or amending plans provides an opportunity for land use leaders to identify and provide for the resolution of emerging problems, such as threats to water quality and supply.²⁷¹ Through this process, the community assesses problems and develops techniques to address such concerns in its own way, responsive to a community's unique circumstances.²⁷²

The Town of New Paltz, New York, for example, adopted a comprehensive plan that encourages water-efficient land use patterns; it designates priority areas for growth and others for conservation as a strategy for encouraging water-efficient land use patterns.²⁷³ It includes a Future Land

wetland[s] and watercourse environments . . ."). *See also infra* notes 273–82 (showing the Town of New Paltz's comprehensive plan and open space preservation and conservation law).

264. *See infra* Parts III.B–H.

265. *See infra* Parts III.B–H.

266. *See infra* Parts III.B–H.

267. *See infra* Parts III.B–H.

268. *See* PETER J. SMITH & COMPANY, INC., TOWN OF NEW PALTZ, NEW YORK, COMPREHENSIVE PLAN 4 (2010) [hereinafter TOWN OF NEW PALTZ, NEW YORK, COMPREHENSIVE PLAN], https://www.villageofnewpaltz.org/download/archives/master_plans/Town-of-New-Paltz-Comprehensive-Plan-Feb-2010.pdf (providing an example of a town comprehensive plan that establishes goals and lay out the process for implementing them).

269. *See infra* Part II.B (showing examples of comprehensive and topical land use plans that are implemented by towns and municipalities and not state regulatory agencies).

270. *See* TOWN OF NEW PALTZ, NEW YORK, COMPREHENSIVE PLAN, *supra* note 268, at 271 (an example of a plan that has a public input program that requires community participation in “build[ing] support and understanding for the plan and to incorporate the visions of the community’s stakeholders in the plan and the planning process.”).

271. *See infra* notes 273–297 and accompanying text.

272. *See infra* notes 273–297 and accompanying text.

273. TOWN OF NEW PALTZ, NEW YORK, COMPREHENSIVE PLAN, *supra* note 268, at 36–40.

Use Plan, the focus of which is an area for future development designated for higher-density development, while preserving the character, open space, farmlands, and natural resources throughout the rest of the town.²⁷⁴ This allows the municipality to concentrate water infrastructure in the growth area and adopt lower-density, low-impact development in the conservation areas.²⁷⁵

The growth zone's compact development allows for shorter transmission systems, lessening the cost of water and sewer infrastructure and future maintenance costs.²⁷⁶ It reduces energy needs for pumping and pressurization.²⁷⁷ Infill development leverages taxpayers' investment in existing water-delivery systems and other infrastructure.²⁷⁸ Higher-density and mixed-use development increases walkability, reduces vehicle miles traveled, lowers CO₂ emissions, and lowers transportation costs.²⁷⁹ A smaller building footprint per household reduces polluting and flood-inducing impervious surfaces, minimizing the pollution of surface waters and groundwater recharge areas that receive the runoff.²⁸⁰ The town created a Preservation and Investment Fund and a Clean Water and Open Space Commission to pay for the acquisition of open space and to set priorities for purchase of title or development rights.²⁸¹ The designation of priority conservation areas guided the town's acquisition of its Open Space Program.²⁸²

The Village of Bannockburn, Illinois adopted a comprehensive plan that committed the village to being a "pioneer in environmentally friendly practices" and adopted a variety of best management practices.²⁸³ The strategies are designed to minimize flooding, reduce pollution, protect

274. *Id.* at 34, 36.

275. *See id.* at 36 ("Concentrating growth here prevents sprawl and minimizes growth's impact on traffic conditions in the village.").

276. *Id.* at 209–11 (showing the town of New Paltz's upgrade to a sewage treatment facility within a dense population area to cut down on usage).

277. *See id.* (showing that the new town wastewater system would be in an area in which the properties already have sewer lines connecting to the sewage system).

278. *See id.* at 210 (proposing "room for increased volume either from infill development of the wastewater service area or expansion of the service area").

279. *See id.* at 36–40 (listing and explaining the different zoning use areas and density levels of the town and proposing more high-density and mixed-use zones).

280. *See id.* at 34–40 (outlining the future land use plan with a focus on the futures concept to "reflect the concern for the environment" in particular restrictions on mixed-use commercial medium-density residential zones).

281. NEW PALTZ, N.Y., CODE §§ 44-4 to 44-8 (2007), <https://ecode360.com/9166301>.

282. *See id.* § 44-1 (explaining the town's motivation for adopting the open space program).

283. COMPREHENSIVE PLAN FOR THE VILLAGE OF BANNOCKBURN 3 (2014), <https://bannockburn.org/wp-content/uploads/2014/05/Approved-Comprehensive-Master-Plan-2014.pdf>

natural resources, and wisely manage stormwater.²⁸⁴ To implement the plan, the village began a Rain Garden Public Participation Program that encourages residents to install and maintain rain gardens on their own private properties, and such rain gardens may be eligible for a village cash grant.²⁸⁵ Bannockburn's rain garden program aims to help with stormwater detention to offset the adverse effects of increased development and impervious surfaces.²⁸⁶ The Village of Bannockburn could include standards for this voluntary program in its zoning code as requirements for new or renovated buildings.

Leesburg, Virginia adopted an Urban Tree Canopy Plan (UTCP) that establishes a goal of increasing its city-wide tree canopy from 20% to 40% of the community.²⁸⁷ An UTCP typically measures the total leaf cover of a city from a birds-eye view, the species composition of the urban forest, and the distribution of tree cover throughout the municipality.²⁸⁸ A well-balanced tree canopy correlates positively with water quality, biodiversity, socioeconomic stability, and mental health.²⁸⁹ It mitigates stormwater runoff, reduces energy consumption, provides habitat for wildlife, promotes species diversity, reduces air pollution, is aesthetically pleasing, increases mental health, and tends to increase property values.²⁹⁰

Under its City Management Plan, Crystal Lake, Illinois adopted a Watershed Stormwater Management Design Manual to guide and control construction projects.²⁹¹ Under the plan, the city created an ad hoc technical advisory committee to examine watershed regulations to increase water quality in its watershed.²⁹² The regulations control the use of fertilizers, herbicides, and pesticides,²⁹³ and reduce the use of salt for snow removal.²⁹⁴

284. *Id.* at 72.

285. *Id.* at 3.

286. See *id.* at 72 (“All of these practices will support the regional goals to minimize flooding, reduce pollution, protect natural resources, and wisely manage stormwater.”).

287. DAVEY RESOURCE GROUP, URBAN FORESTRY MANAGEMENT PLAN: TOWN OF LEESBURG, VIRGINIA 26 (2006), <https://www.leesburgva.gov/home/showdocument?id=1003>.

288. *Urban Natural Resources Stewardship: National Assessments of Urban Forests*, U.S. DEP'T OF AGRIC. FOREST SERV. (Oct. 3, 2019), https://www.nrs.fs.fed.us/urban/landscape_change/national_assessments/.

289. See generally Charles J. Fausold & Robert J. Lillieholm, *The Economic Value of Open Space: A Review and Synthesis*, 23 ENVTL. MGMT. 307, 308 (1999) <https://doi.org/10.1007/s002679900188> (explaining the benefits of preserving open spaces).

290. *Id.*

291. HEY AND ASSOCIATES, INC., CRYSTAL LAKE WATERSHED STORMWATER MANAGEMENT DESIGN MANUAL 1-1 (2007), <https://www.crystallake.org/home/showdocument?id=15263>.

292. See generally *id.* at 1-9 (describing the intent of the Watershed Districts to increase water quality in the watershed).

293. *Id.* at 3-2.

294. *Id.*

Reducing fertilizer use leads to less phosphorus in the watershed and, consequently, less algae growth.²⁹⁵ Less salt is critical to the Plan's objective of preventing greater acidity of Crystal Lake and promoting ecosystem health.²⁹⁶ Another objective of the Plan is to increase the amount of permeable pavement and associated vegetation on developed property to increase water absorption and reduce runoff and flooding.²⁹⁷

C. Zoning

In Cheshire, Connecticut, zoning regulations protect the community's tree canopy by regulating the removal of mature trees, requiring that they be retained on construction sites to the greatest extent possible.²⁹⁸ Its zoning also encourages tree preservation in areas not disturbed by construction.²⁹⁹ The application of these provisions prevents sedimentation and erosion, maintains ecological balance, and provides protection from the sun and wind.³⁰⁰ On sites with limited vegetation, the zoning requires that developers provide vegetative cover, including trees.³⁰¹

Henderson County, Kentucky uses its zoning code to establish rules and regulations to prevent adverse impacts of surface mining of coal, such as degradation of water, soils, and agricultural production.³⁰² The code requires mining operators to control sediment and off-site erosion, aimed at reducing runoff from disturbed areas.³⁰³ The county requires that any surface drainage from disturbed areas must pass through sedimentation ponds before leaving the permit area.³⁰⁴ These sedimentation ponds are required in all affected drainage areas prior to any mining, in order to control sedimentation and protect water quality,³⁰⁵ and a registered professional engineer must design the sedimentation ponds.³⁰⁶ Sediment removal must be done in a manner that minimizes adverse effects on surface waters.³⁰⁷

295. *See generally id.* (explaining algae growth is a harmful byproduct of phosphorous, and that limiting phosphorous could help reduce algae growth and improve watershed conditions).

296. *See id.* (showing the City of Crystal Lake's devotion in requiring annual filling of a deicing usage plan including an explanation of how salt usages will be minimized).

297. *Id.* at 3-4, 3-12.

298. CHESHIRE, CONN., ZONING REGS. § 44A.10.11 (1993) (requiring developers of affordable housing projects to retain "all mature trees . . . on the site to the greatest extent possible")

299. *Id.*

300. *Id.*

301. *Id.*

302. HENDERSON CTY, KY. ZONING CODE, § A-27.01.

303. *Id.* § A-27.13(A).

304. *Id.* § A-27.13(A)(2).

305. *Id.*

306. *Id.* § A-27.13(A)(4).

307. *Id.* § A-27.13(A)(3).

Portland, Oregon adopted a floating zone called an EcoDistrict to promote water conservation and quality.³⁰⁸ The city uses a Performance Area Toolkit that provides direction, methods, and processes for assessing performance.³⁰⁹ These techniques are contained in the floating zone and applied, as appropriate, to areas of the city where water consumption needs to be reduced.³¹⁰ They include targets for per capita water consumption, provide for water reclamation and reuse, require water-efficient landscaping and onsite wastewater treatment, and control stormwater runoff.³¹¹

The Town of Big Flats, New York adopted an overlay zoning district to protect its drinking water aquifers.³¹² The Aquifer Protection Overlay District (APOD) designates three groundwater areas for protection based on soil types, permeability, and development pressures.³¹³ Each district is subject to project review processes and standards that apply in addition to the underlying zoning and site plan regulations.³¹⁴ The APOD prohibits high risk land uses and gives the planning board, as it reviews and approves projects, authority to request additional information from professional hydro-geologists or other experts to ensure protection from harmful commercial and industrial uses proposed within the APOD areas.³¹⁵

Similarly, the Town of Goshen, also in New York, identified five overlay districts in its comprehensive plan and zoning ordinance to protect specific types of natural resources.³¹⁶ Three of the five overlay districts directly address water protection.³¹⁷ The Flood Plain and Ponding Area

308. See PORTLAND SUSTAINABILITY INSTITUTE, THE ECODISTRICTS TOOLKIT: PRIORITIZING PROJECTS IN AN ECODISTRICT 3 (2011), https://ecodistricts.org/wp-content/uploads/2013/03/4_Toolkit_EcoDistrict_Assessment_v_1.12.pdf (“EcoDistricts are a comprehensive strategy to accelerate sustainable development at the neighborhood scale by integrating building and infrastructure projects with community and individual action.”).

309. *Id.* at 4.

310. *Id.* at 15.

311. See *id.* at 22–25 (outlining the techniques to be applied in EcoDistricts for reducing water consumption and providing examples of each).

312. TOWN OF BIG FLATS COMPREHENSIVE PLAN 32 (2006), https://www.bigflatsny.gov/sites/bigflatsny/files/file/file/big_flats_comprehensive_plan.pdf.

313. *Id.*

314. *Id.*

315. See generally *id.* at 1, 32 (describing how APODs serve to protect “the health, safety, and welfare of the people” and “preserve the quality and quantity of the town’s groundwater resources to ensure a safe drinking water supply”); BIG FLATS, N.Y., CODE OF ORDINANCES § 17.24.020, https://library.municode.com/ny/big_flats/codes/code_of_ordinances?nodeId=TIT17ZO_CH17.24OVDI_17.24.020AQPROVDIAP (describing the intent of APODs). The interests of APODs include “public health, safety, and general welfare.” *Id.* They also “preserve the quality and quantity of the town’s groundwater resources in order to ensure a safe and healthy drinking water supply.” *Id.*

316. GOSHEN, N.Y., UPDATED COMPREHENSIVE PLAN FOR THE TOWN OF GOSHEN 33 (2009), <http://www.townofgoshen.org/UpdatedCompPlan2009/Comprehensive%20Plan,%201-12-09.pdf>.

317. *Id.*

Overlay District controls development within areas subject to periodic inundation and ponding.³¹⁸ The Stream Corridor and Reservoir Watershed Overlay District protects the scenic character and water resource values of designated rivers and streams.³¹⁹ The Aquifer Overlay District protects groundwater resources that provide both public water supplies and drinking water for private wells.³²⁰

D. Site Plan Regulations

Site plan regulations adopted by the Town Board in Greenburgh, New York require its planning board to ensure that new and renovated buildings are water efficient.³²¹ Under the town's Green Building Initiative and Energy Construction Standards, an applicant seeking site plan review must submit a Green Building Project Checklist completed by a LEED Accredited Professional,³²² a Green Building Worksheet, and any other documents that may be necessary to demonstrate compliance with the town's green building requirements.³²³ Site plan approval will not be granted until the designated Green Building Official of the town approves the design and construction plans of the applicant.³²⁴ A building permit and certificate of occupancy will not be issued unless plans and actual construction comply with the checklist, and, uniquely, post-occupancy documentation is required to show continuing compliance with the standards.³²⁵

In Pennsylvania, Lancaster County's Conservation District provides best management practices that constituent localities can use to prevent sedimentation and erosion as they review and approve development

318. *Id.*

319. *Id.*

320. *Id.*

321. GREENBURGH, N.Y., CODE § 233-1 (2009).

322. *Id.* § 233-5(A); see also *Checklist: LEED v2009 for New Construction*, U.S. GREEN BLDG. COUNCIL, <https://www.usgbc.org/resources/new-construction-v2009-checklist-xls> (last visited Dec. 29, 2019) (providing a link to the LEED project checklist “for [n]ew [c]onstruction and [m]ajor [r]enovations”). “LEED, or Leadership in Energy and Environmental Design, is the most widely used green building rating system in the world. Available for virtually all building, community and home project types, LEED provides a framework to create healthy, highly efficient and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement.” *Green Building Leadership Is LEED*, U.S. GREEN BLDG. COUNCIL, <https://new.usgbc.org/leed> (last visited Dec. 29, 2019).

323. GREENBURGH, N.Y., CODE § 233-5.

324. *Id.* § 233-6.

325. *Id.*

proposals.³²⁶ The Rouge River Wet Demonstration Project provides similar guidance.³²⁷ It contains structural elements including artificial wetland creation, detention ponds, swales, pervious pavement, vegetative cover, water quality inlets, and rain gardens.³²⁸ These techniques slow down and reduce the volume of runoff that reaches downstream surface waters.³²⁹

The Pennsylvania Department of Environmental Protection assists local governments in the state by promulgating and recommending practices to minimize stormwater runoff.³³⁰ These practices include site planning strategies, such as low-impact development, conservation design, and cluster development.³³¹ The practices also include protecting sensitive environmental features, reducing impervious cover, and disconnecting storm leaders.³³²

*E. Water Conservation*³³³

Water conservation is directly tied to water quality:

Water quality is fundamentally connected to water quantity by the fact that water of inferior quality effectively reduces the amount of available water for some users (or it can dramatically increase the cost of obtaining available water because of necessary treatment). Despite this important linkage, most investigations that evaluate water stress treat the problems of water quality and water quantity separately.³³⁴

326. *Erosion & Sedimentation Best Management Practices*, LANCASTER CTY. CONSERV. DIST., <http://lancasterconservation.org/erosion-sedimentation/earth-disturbance/es-bmps/> (last visited Dec. 27, 2019).

327. ROUGE RIVER NAT'L WET WEATHER DEMONSTRATION PROJECT, STORMWATER MANAGEMENT: BEST MANAGEMENT PRACTICES (BMPs), https://www.michigan.gov/documents/deq/ess-nps-savvy-bmp_209386_7.pdf (last visited Dec. 27, 2019).

328. *Id.*

329. *Id.*

330. PA. DEP'T OF ENVTL. PROT., PENNSYLVANIA STORMWATER BEST MANAGEMENT PRACTICES MANUAL 1.1 (2006), <http://pecpa.org/wp-content/uploads/Stormwater-BMP-Manual.pdf>.

331. *Id.* at 5.1.

332. *Id.* at 5.2.

333. *See generally* LAND USE L. CTR., INTEGRATING WATER EFFICIENCY INTO LAND USE PLANNING IN THE INTERIOR WEST: A GUIDEBOOK FOR LOCAL PLANNERS (2018) (providing hundreds of techniques, sample codes, and community examples that explain how to reduce the water footprint of new development).

334. David M. Borrok et al., *A Framework for Incorporating the Impact of Water Quality on Water Supply Stress: An Example from Louisiana, USA*, 54 J. AM. WATER RESOURCES ASS'N 134, 134–35 (2018).

The efficient use of water reduces wastewater, which “may carry nutrients, biological and chemical contaminants, floating wastes, or other pollutants. Upon discharge, wastewater ultimately finds its way into groundwater or surface waters, contributing to their pollution.”³³⁵ One strategy for reducing waste water is simply to use less water.³³⁶ This allows wastewater treatment plants and on-site treatment systems to “more efficiently treat incoming waste.”³³⁷ The more efficiently water is used, the better water quality will be.³³⁸

Asheville, North Carolina incentivizes water conservation through bonus-density zoning to increase water efficiency.³³⁹ The city offers more residential units under its zoning code for projects that feature green building amenities, including water efficiency measures for the building and site.³⁴⁰ Asheville also offers a rebate of fees associated with the installation of stormwater and graywater collection devices.³⁴¹

Dutchess County, New York developed a Model Water Resource Management Zoning Ordinance for its constituent localities.³⁴² The model allows as-of-right zoning status to water conserving projects, while requiring other developments to seek special or conditional-use permits.³⁴³ Site plan applications where projected water consumption exceeds natural recharge are allowed only by special permit, while projects where consumption is less than or equal to natural recharge are permitted as-of-right.³⁴⁴ This streamlines the approval process for developers of water-conserving projects, reducing soft costs of the approval process and getting the project to the market in a timely manner.³⁴⁵ The model contains conditions for the issuance of the special permit, including a requirement that applicants demonstrate how water quality impacts will be mitigated.³⁴⁶ Applicants must identify the source of the water being used, water quantity required, water-use

335. TRENT R. SCHNEIDER, LONG ISLAND SOUND: WATER CONSERVATION AND MARINE WATER QUALITY 1 (2019) (emphasis omitted), <http://longislandsoundstudy.net/wp-content/uploads/2010/03/fact14.pdf>.

336. *Id.*

337. *Id.*

338. *Id.*

339. ASHEVILLE, N.C., CODE OF ORD. § 7-16-1 (2019).

340. *Id.*

341. CITY OF ASHEVILLE, N.C., DEV. SERVICES DEP'T., FEE AND CHARGES MANUAL 2019-2020, at 8 (2019), <https://drive.google.com/file/d/1AHxiSPE0bN0qIyaQ5bsYv-7j10djXoY6/view>.

342. RUSSELL URBAN-MEAD, THE CHAZEN COS., A MODEL LOCAL ZONING LAW FOR MUNICIPAL WATER RESOURCE MANAGEMENT 1 (2010).

343. *Id.*

344. *Id.* at 5.

345. *Id.*

346. *Id.* at 6.

minimization measures to be implemented, water-recycling measures to be installed, and measures used to enhance onsite recharge.³⁴⁷

The Town of Wayland, New York enacted a law establishing a water conservation and permitting program.³⁴⁸ The town's primary source of water is an underground aquifer, which is naturally limited in quantity and was experiencing increasing pollution.³⁴⁹ New development increased groundwater pumping, furthering pollution of the aquifer.³⁵⁰ The town found that if water quality and quantity problems were not addressed, and water conservation and permitting programs not instituted, irreparable damage could be done to the local aquifer.³⁵¹ In response, the local legislative body enacted Local Law No. 3 to ensure that the quality and quantity of water available meets both present and future demands.³⁵² The purpose of the law is to promote "the public health, comfort, convenience, safety, welfare and environment of the Town of Wayland and its inhabitants, in order to protect the public potable water supply of the town from the possibility of contamination or overuse, to protect the aquifer in the town, and to supplement permit requirements."³⁵³

Local Law 3 requires a permit for the installation of any new water supply system.³⁵⁴ In order to obtain a permit, the applicant must include a map showing the water supply system, watershed maps showing the watershed or aquifer affected, profiles of the proposed facilities, proposed contracts, an engineer's report, analysis of the water supply, treatment methods, and project justification.³⁵⁵

Boulder, Colorado adopted water conservation measures in its Green Building Program, which requires proposed developments to qualify as green buildings.³⁵⁶ Applicants can earn green points by incorporating into their developments the following improvements: hardscape shading by preserving existing mature trees onsite or planting shade trees; xeriscaping methods that conserve water, such as reduced turf areas, wood chip mulching, xeric plants grouped by water needs, and water conserving irrigation systems; high-efficiency automatic irrigation systems; water-efficient fixtures, such as low-

347. *Id.*

348. WAYLAND, N.Y., LOCAL LAW NO. 3 § 1 (1996).

349. *Id.* at § 4.

350. *Id.* § 4(C) (explaining that pumping had resulted in conditions, including "(1) loss of water[:]; (2) low water; (3) cloudy or muddy water; and (4) bad tasting and/or bad smelling water").

351. *Id.*

352. *Id.*

353. *Id.* § 3.

354. *Id.* § 7.

355. *Id.* § 9(B).

356. CITY OF BOULDER, COLO., GREEN BUILDING AND GREEN POINTS GUIDELINE BOOKLET §§ 10-7.5-3 to 10-7.5-4 (2013).

flow showerheads and toilets; and surface water flow management through the use of permeable surfaces.³⁵⁷

F. Local Nuisance Laws

Local laws that define and regulate nuisances to protect water quality provide an innovative legal option for municipalities to consider.³⁵⁸ Riparian land owners adversely affected by groundwater or surface water pollution caused by their neighbors may bring an action under common law private nuisance.³⁵⁹ Under state common law, bringing an action typically requires that the plaintiff carry the burden of proving that the neighbor's actions are unreasonable.³⁶⁰ In many states, case law requires courts to balance multiple factors and provides few clear definitions of reasonable use, which increases the costs of such suits and renders the results uncertain.³⁶¹ Local governments can provide some clarity for potential plaintiffs by designating water pollution as a public nuisance, broadly targeting activities that harm and diminish water quality.³⁶² Not incidentally, such laws strengthen and broaden the statutory authority of municipalities to protect local water quality through municipal enforcement.³⁶³

Common law causes of action can coexist with civil enforcement under federal, state, and local clean water regulations.³⁶⁴ In *Merrick v. Diageo Americas Supply, Inc.*, the U.S. Court of Appeals for the Sixth Circuit found that the plaintiffs had stated a cause of action for common law nuisance when a whiskey distillery emitted tons of ethanol emissions, leading to the growth of a particularly harmful fungus.³⁶⁵ Because ethanol is regulated under the Clean Air Act (CAA), the defendant alleged that the nuisance claim was preempted.³⁶⁶ The Sixth Circuit ruled that the CAA expressly reserves the right of the states to prescribe requirements more stringent than those set

357. *Id.* at § 10-7.5-4.

358. *See infra* notes 359–68 and accompanying text.

359. *See* Anne M. Payne, *Cause of Action in Private Nuisance for Water Pollution*, § 13, in 37 CAUSES OF ACTION 2D, at 281 (2019) (describing the property interest of riparian owners in the context of private action over water quality).

360. WILLIAM B. STOEBUCK & DALE A. WHITMAN, *THE LAW OF PROPERTY* 416 (3d ed. 2000).

361. Payne, *supra* note 359, § 12.

362. *See id.* § 3 (describing public nuisance actions in the context of groundwater).

363. *See infra* notes 364–74 and accompanying text (providing examples of successful nuisance laws).

364. *See* Payne, *supra* note 359, § 7 (describing federal and state administrative remedies for water pollution protection).

365. *See Merrick v. Diageo Ams. Supply, Inc.*, 805 F.3d 685, 686, 695 (6th Cir. 2015) (rejecting the defendant's argument that the Clean Air Act should preempt such common law claims).

366. *Id.* at 689.

under the CAA.³⁶⁷ Further, those requirements include state common law claims, such as nuisance.³⁶⁸

Yonkers, New York adopted a statute prohibiting pollution relating to its separate storm sewer system as part of its obligation to conform to a required state permitting system as a regulated utility.³⁶⁹ The city is required to regulate the contribution of pollutants to the sewer system; to prohibit illicit connections, activities, and discharges; and to establish legal authority to carry out all inspection, surveillance, and monitoring procedures necessary to ensure compliance.³⁷⁰ The Yonkers law creates a nuisance cause of action and explains the remedies for violation of any provisions of the article.³⁷¹ The Yonkers law states:

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this article is a threat to public health, safety, and welfare and is declared and deemed a nuisance and may be summarily abated or restored at the violator's expense, and/or a civil action [brought by the City of Yonkers Stormwater Management Officer] to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken.³⁷²

The Borough of Pennington, New Jersey creates a nuisance cause of action for a broad range of conditions, including pollution that negatively affects public health or the environment.³⁷³ A law adopted by Pennington, New Jersey defines a nuisance as:

Any matter, thing, condition or act which after investigation by the Health Officer or other enforcing official is deemed to be injurious, detrimental or a menace to the public health or environment or is deemed to be an annoyance or interfere with the comfort or well-being of the inhabitants of the Borough is hereby declared to be a nuisance and shall include but not be limited to the following: . . .
Pollution or the existence of a condition or discharge or release

367. *Id.* at 693.

368. *Id.* at 694–95; *see also* *Little v. Louisville Gas & Elec. Co.*, 805 F.3d 695, 696–97 (6th Cir. 2015) (holding a coal-burning plant operator could not avoid common-law tort claims on grounds that the emissions or airborne dust and coal ash on neighboring properties were solely governed by the plant's CAA permit).

369. YONKERS, N.Y., CODE § 96-39 (2007); *see also infra* notes 465–75 and accompanying text (describing the EPA's permitting requirements for municipal stormwater systems).

370. *Id.*

371. *Id.* § 96-57.

372. *Id.*

373. PENNINGTON, N.J., CODE § 136-3 (2001).

which causes or threatens pollution of any surface water or subsurface water of the Borough.³⁷⁴

Adoption of local nuisance laws that include language defining and prohibiting landowner activities that threaten water quality, not only supplements municipal legal authority to protect water quality, but provides a statutory backbone to an otherwise circumstantial private nuisance action.³⁷⁵

G. Mandatory Well Testing

The Town of East Fishkill, New York adopted a law that requires property owners with individual groundwater wells to have the quality of the well water tested prior to the sale of their property.³⁷⁶ The purpose of the law is to “requir[e] mandatory private well testing for all properties in the Town of East Fishkill that rely on a private water supply which is utilized for purposes of human consumption.”³⁷⁷ It also applies to multifamily and nonresidential properties and residential rental properties that are subject to testing under the New York State Sanitary Code.³⁷⁸

The required water tests must be filed with the Town of East Fishkill Building Department and County Health Department and made available for public inspection and reproduction.³⁷⁹ All provisions of the mandate are enforced by “[t]he Town of East Fishkill Building Inspector, Code Enforcement Officers, Zoning Administrator, Deputy Zoning Administrator and the Fire Inspector.”³⁸⁰ This legal strategy is particularly effective because the law prohibits the town building department from providing a Certificate of Occupancy to a prospective purchaser who requires it to secure title insurance and a mortgage.³⁸¹

H. Stormwater Remediation Fee

Water quality can be protected by limiting on-site stormwater runoff.³⁸² This is accomplished through extensive regulation of the construction

374. *Id.*

375. *See infra* Part III.F.

376. EAST FISHKILL, N.Y., CODE § 189-3B (2007).

377. *Id.*

378. *Id.* at §§ 189-5, 189-7.

379. *Id.* at § 189-6.

380. *Id.* at § 189-8A.

381. *Id.* at § 189-8B.

382. ROUGE RIVER NAT’L WET WEATHER DEMONSTRATION PROJECT, *supra* note 327.

process by imposing stewardship practices as a condition for receiving municipal approval for the proposed development.³⁸³ This applies only to new developments, not to the existing properties that contribute to stormwater runoff, because stormwater runoff is the responsibility of the local government to manage.³⁸⁴ The City of Ithaca, New York found a way to incentivize the owners of already-developed properties to reduce stormwater runoff, as well as to pay for the public facilities needed to manage and treat stormwater.³⁸⁵ Municipalities have the authority to impose fees to pay for the capital costs and administrative expenses related to specific users of municipal services.³⁸⁶

In Ithaca, individual developed properties contribute to such stormwater management costs in direct proportion to the amount of impervious coverage they contain.³⁸⁷ The city used a geographic database of all impervious surface area and determined that the average amount of impervious surface area on a property with a one-, two-, or three-family home is approximately 2,300 square feet.³⁸⁸ City officials used this metric to calculate an Equivalent Residential Unit (ERU) and to determine the user fee for larger commercial and multifamily properties.³⁸⁹ Small-scale residential properties pay a flat fee because they have roughly similar amounts of impervious surface area throughout the city.³⁹⁰ Larger residential, commercial, and manufacturing properties pay a fee that is based on their ERUs.³⁹¹

The city's stormwater remediation fee law includes incentives to encourage less runoff by lowering the fee for owners who reduce the amount of impervious coverage of their properties, such as installing pervious pavers or a green roof.³⁹² There is also a credit for certain stormwater engineering practices or structures.³⁹³

383. *See infra* notes 385–93 and accompanying text (discussing Ithaca, New York's incentives to reduce stormwater runoff).

384. *National Menu of Best Management Practices (BMPs) for Stormwater*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/national-menu-best-management-practices-bmps-stormwater#post> (last visited Dec. 27, 2019).

385. CITY OF ITHACA, N.Y., CODE § 283-3 (2014).

386. N.Y. MUN. HOME RULE § 10(1)(ii)(a)(9-a).

387. CITY OF ITHACA, N.Y., CODE § 283-2.

388. *What is an Equivalent Residential Unit?*, CITY OF ITHACA, <https://cityofithaca.org/FAQ.aspx?QID=191> (last visited Dec. 27, 2019).

389. CITY OF ITHACA, N.Y., CODE § 283-3.

390. *See id.* (stating that any residential or nonresidential lot that has an impervious surface area that is less than or equal to one ERU is rounded up to one ERU).

391. *Id.*

392. *How Can I Reduce My Stormwater User Fee?*, CITY OF ITHACA, <https://cityofithaca.org/Faq.aspx?QID=193> (last visited Dec. 27, 2019).

393. *Id.*

IV. CORRECTING PAROCHIALISM THROUGH COLLABORATION

This Article argues that local governments must play a central and proactive role in protecting water quality.³⁹⁴ Municipalities are the locus of the problem and are compelled by practical circumstances to respond to threats to their water supplies.³⁹⁵ They are the most decentralized level of government with the legal authority to act effectively and, under the principal of subsidiarity,³⁹⁶ deserve deference and respect from the other governmental and nongovernmental actors who are invested in watershed health.³⁹⁷ The examples discussed above demonstrate that local governments can be effective actors in addressing critical resource problems.³⁹⁸

Still, local governments are rightly criticized for the multiple barriers they face that obstruct effective action, particularly regarding inter-jurisdictional problems.³⁹⁹ The danger in taking this criticism too seriously is that it tends to identify local control as the problem to be cured rather than a foundation on which to build an intergovernmental process that is responsive to state and federal needs. This situation has been described as “an institutional conundrum whereby the entity with the greatest potential to solve the problem currently lacks the capacity to do so such that efforts to respond to the problem tend to exacerbate it rather than resolve it.”⁴⁰⁰

This Part provides a partial response to those who are critical of depending on local action to protect natural resources.⁴⁰¹ Building on the remarkable examples of effective action discussed in Part III, the case studies below illustrate several methods of collaboration that respond to the criticisms of localism and help, first, to explain the principle of “collaborative subsidiarity” developed in the Article’s conclusion, and, second, to justify it as a predicate for regional, state, and federal policy and lawmaking.⁴⁰²

394. See *supra* Part III.

395. See John R. Nolon, *In Praise of Parochialism: The Advent of Local Environmental Law*, 26 HARVARD ENVTL. L. REV. 365, 365–77 (2002) (describing the scope, extent, and character of local environmental regulations where there is an absence of centralization at the federal level).

396. See ELLICKSON, *supra* note 35 (explaining the subsidiarity principle).

397. See Nolon, *Low Carbon Land Use*, *supra* note 263 (suggesting this principle applies to a host of contemporary problems, including the mitigation and adaptation to climate change).

398. See *supra* Part III.

399. See *infra* Part V.C (explaining different perspectives on the interplay of local and state partnerships in areas where local governments are less effective).

400. Sarah K. Adams-Schoen, *Beyond Localism: Harnessing State Adaptation Lawmaking to Facilitate Local Climate Resilience*, 8 MICH. J. ENVTL. & ADMIN. L. 185, 220 (2018) (footnote omitted).

401. See *infra* Parts IV.A–H.

402. See *infra* Parts IV.A–H.

A. State-Provided Technical Assistance

New York's Community Risk and Resiliency Act of 2014 provides to local governments critically-needed data, maps, and laws to adapt to the consequences of climate change.⁴⁰³ It expands the technical capacity of municipalities to respond by requiring the New York Department of State to provide sea level rise data and maps as well as model laws that they can adapt to projected inundation and flooding associated with global warming.⁴⁰⁴ These data, maps, and model laws are not products that most localities have the resources to develop and are not properly created at the state level where agencies can produce information and model regulations relevant to constituent communities that share vulnerabilities to climate change and the inundation of their coastal neighborhoods.⁴⁰⁵ The maps are based on data that reflect various scenarios of sea level rise and allow localities to choose the scenario that they deem prudent to use for planning.⁴⁰⁶ The model laws are drafted so that municipal leaders can adapt them to their local circumstances.⁴⁰⁷ These resources and their adaptability to local circumstances are built on the understanding that local circumstances vary, that local officials best understand those circumstances, and that those officials need resources to guide decision-making.⁴⁰⁸

B. State-Mandated Impact Review

The New York DEC amended its rules for conducting environmental review under the State Environment Quality Review Act (SEQRA).⁴⁰⁹ Under this Act, local governments must conduct environmental impact reviews regarding any decisions they make that might have an adverse environmental impact.⁴¹⁰ The new rules require local agencies to consider the impact of their

403. Community Risk and Resiliency Act, 2014 N.Y. LAWS 1115–19.

404. *Id.*

405. *Id.*

406. *See id.* (explaining that different data sets from different agencies will produce various levels of sea rise, and localities must show that one of them was considered when planning).

407. *See id.* (stating laws are drafted with different data sets in mind so that municipalities may choose a model related to the relevant data).

408. *Id.*

409. N.Y. STATE DEP'T OF ENVTL. CONSERVATION, STATE ENVIRONMENTL QUALITY REVIEW ACT: FINDINGS STATEMENT FOR AMENDMENTS TO 6 NYCRR PART 617 (2018), at 24 (2018), https://www.dec.ny.gov/docs/permits_ej_operations_pdf/617fnlfindings.pdf.

410. N.Y. STATE DEP'T OF ENVTL. CONSERVATION, THE SEQRA HANDBOOK 181–83, 188 (4th ed. 2019).

decisions on climate change and the impact of climate change on projects subject to their review and approval under their land use authority.⁴¹¹

The amended regulations require local land use agencies to conduct climate change impact reviews when adopting or amending zoning laws, adopting or amending comprehensive plans, and reviewing local land use applications by developers.⁴¹² This regulatory amendment “may turn out to be one of the most effective features of the state’s adaptation regime.”⁴¹³ It demonstrates that local resistance to taking effective environmental action may be overcome by state requirements that integrate needed strategies into roles currently played by municipal governments.⁴¹⁴ The strategy is effective because it respects the prerogative of local governments to make judgments within the context of a state-required impact review regime. The ability of localities to conduct this review is greatly assisted by a policy document published by the DEC that contains detailed standards for determining the effect of projects on climate change and adjusting development design to adapt to climate change.⁴¹⁵

C. Bottom-Up Intergovernmental Cooperation

Municipalities can take the initiative to reach out to higher levels of government for needed technical support.⁴¹⁶ The Master Plan of Cannon Township, Michigan, for example, contains a goal of establishing “a working partnership with the Kent County Health Department, Michigan Department of Environmental Quality, and other applicable local, state, and federal environmental agencies to ensure that the quality and quantity of water available to Township residents is acceptable.”⁴¹⁷ The Master Plan recognizes Bear Creek as one of the township’s most sensitive environmental features and one of the most important natural resources that embodies the natural character of the community.⁴¹⁸ The municipality amended its zoning to add a Bear Creek Watershed Protection Overlay District “to preserve and enhance the integrity of certain creeks and their tributaries located within the

411. N.Y. COMP. CODES R. & REGS. tit. 6, § 617.9 (2019).

412. Adams-Schoen, *supra* note 400, at 238.

413. *See id.* (discussing SEQRA as it applies to land use).

414. *See supra* notes 409–13 and accompanying text.

415. *See* N.Y. STATE DEP’T OF ENVTL. CONSERVATION, ASSESSING ENERGY USE AND GREENHOUSE GAS EMISSIONS IN AN ENVIRONMENTAL IMPACT STATEMENT 1–3 (2009), https://www.dec.ny.gov/docs/administration_pdf/eisghgpolicy.pdf.

416. *See infra* notes 417–25 and accompanying text.

417. CANNON TWP., MASTER PLAN UPDATE 4 (2015).

418. *Id.* at 6.

Bear Creek Watershed,⁴¹⁹ which includes Bear Creek, Stout Creek, and Armstrong Creek, as well as any flowing tributaries.⁴²⁰

The township's zoning ordinance recognizes its creeks and streams as valuable natural resources that contribute to its rural character, provide scenic views, serve as a habitat for fish and wildlife, minimize land erosion, protect water quality, avoid runoff of nutrients into creeks and streams, and maintain natural water temperature levels of creeks and streams.⁴²¹

In another example, the City of Boulder, Colorado and Boulder County worked together to create an intergovernmental agreement and to adopt the Boulder Valley Comprehensive Plan to concentrate urban development in the city as part of a strategy to preserve lands and natural resources beyond the city's limits.⁴²² The Plan's natural environment chapter memorializes the city and county's agreement to promote water resource conservation through a combination of regulation, public education, monitoring, and appropriate water usage.⁴²³

The Plan establishes growth boundaries to phase growth and creates compact and sustainable settlement patterns by capitalizing on vacant or underused sites and by carefully considering the expansion of the urban center, reducing the encroachment of city growth upon lands less suitable for development because of their environmental conditions and the high cost of extending infrastructure, and providing public services.⁴²⁴ Implementation involves the acquisition of open space lands and the purchase of water rights using both county and city resources.⁴²⁵

D. State-Created Intermunicipal Initiatives

State legislatures can proactively encourage intermunicipal collaboration by adopting legislation permitting cost-effective joint action.⁴²⁶ The Greater New Haven Water Pollution Control Authority (GNHWPCA) is an intermunicipal mechanism created under a state statute that permits and

419. CANNON TWP., MICH., ZONING ORD. § 18.01.B (2018).

420. *Id.* § 18.0.

421. *Id.* § 18.01.

422. CITY OF BOULDER, COLO., BOULDER VALLEY COMPREHENSIVE PLAN 5 (2010), https://www-static.bouldercolorado.gov/docs/boulder-valley-comprehensive-plan-2010-1-201410091122.pdf?_ga=2.108929349.694402409.1567370896-1704082693.1567370896.

423. *Id.* at 36.

424. *Id.* at 7.

425. JOSEPH N. DE RAISMES, III, ET AL., GROWTH MANAGEMENT IN BOULDER COLORADO: A CASE STUDY 17–25 (1999), <https://docplayer.net/11640843-Growth-management-in-boulder-colorado-a-case-study.html>.

426. *See infra* notes 427–35 and accompanying text.

encourages the creation of regional water pollution control authorities.⁴²⁷ Four municipalities took advantage of this special state law to create the GNHWPCA: New Haven, Hamden, East Haven, and Woodbridge.⁴²⁸ The Authority's mission is "[t]o provide reliable municipal wastewater services in compliance with applicable laws, in a cost efficient and effective method, and with the intent and desire to protect the environment and public health of the constituent municipalities."⁴²⁹ The Authority was created for the operation of a wastewater sewage treatment plant to collect, transport, treat, and dispose of sewage generated within the cooperating municipalities.⁴³⁰

The State of California acted to assist small water supply systems that lack the capacity to operate efficiently.⁴³¹ A small water system is one that provides water to fewer than 10,000 customers; such systems make up more than 97% of the nation's public water systems (PWS).⁴³² Because of their lack of resources and technical capacity, they are prone to regulatory lapses and a relatively high rate of groundwater contamination.⁴³³ The state legislature facilitated the ability of the State Water Resources Control Board to integrate struggling PWSs through state-aided consolidation.⁴³⁴ The state assistance includes badly needed capital financing.⁴³⁵

427. *About GNHWPCA*, GREATER NEW HAVEN WATER POLLUTION CONTROL AUTH. (2018), <https://gnhwpc.com/about-gnhwpc/about-gnhwpc/> (last visited Dec. 27, 2019).

428. *Id.*

429. *Id.* (emphasis omitted).

430. *See id.* (describing how the sewer system operated by the GNHWPCA "includes 555 miles of pipeline, 30 pumping stations[,] and a[] . . . secondary water treatment plant" that holds up to "40 million gallons per day"). A "wastewater system" is defined as "any device, equipment, appurtenance, plant facility and method for receiving, collecting, transporting, reducing, treating, reclaiming, disposing, separating or discharging sewage or the residue from the treatment of sewage". *Id.*

431. Nathaniel Logar et al., *Ensuring Safe Drinking Water in Los Angeles County's Small Water Systems*, UCLA SCH. OF L., PRITZER ENVTL. L. & POL'Y BRIEFS, PRITZER BRIEF NO. 11, Dec. 18, 2018, at 1, 17.

432. *Learn About Small Drinking Water Systems*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/dwcapacity/learn-about-small-drinking-water-systems> (last updated Sept. 30, 2016).

433. *Id.*

434. Logar et al., *supra* note 431, at 18 (footnote omitted) (defining "consolidation" as the "joining [of] two or more public water systems, state small water systems, or affected residences not served by a public water system, into a single public water system"). The benefits of consolidation include: "(1) improved economies of scale; (2) increased financial opportunities for water systems; (3) reduced duplication of services; (4) increased reliability; (5) increased system flexibility; and (6) enhanced protection of public health, skill improvement, and service efficiency." *Id.* (footnote omitted).

435. Assemb. B. 1471, 2013–2014 Leg. (Cal. 2014). California's Proposition 1 created a \$7.1 billion bond for water improvements, making \$520 million available for projects providing "clean, safe, and reliable drinking water." Logar et al., *supra* note 431, at 17 (citation omitted). The Proposition was created after Los Angeles received no funding from an already limited funding pool for small water systems provided by the federal government. *Id.* The Proposition's bond will be used for two Los Angeles County drinking water projects, both in water systems serving fewer than 10,000 customers, and for wellhead treatment to provide residents with cleaner water. *Id.* Working within the bounds of

E. Intergovernmental Watershed Planning

State laws that permit local governments to jointly exercise their land use planning and regulatory authorities can be used to create vertically- and horizontally-integrated mechanisms to protect water supplies.⁴³⁶ Nearly two dozen New York municipalities in a shared watershed crafted an intermunicipal agreement that includes the county water authority and department of planning, non-governmental stakeholders, and the DEC.⁴³⁷ Together they formed a council and adopted the Moodna Creek Watershed Conservation and Management Plan.⁴³⁸ The plan supports source water protection, regional watershed planning, and research and monitoring of water resources.⁴³⁹ The purpose of the Moodna Creek Watershed Intermunicipal Council is “[t]o continue to work together across municipal boundaries in order to protect, conserve, and enhance the water resources of the Moodna Creek and its watershed.”⁴⁴⁰

This intermunicipal initiative demonstrates how mechanisms can be created that address certain criticisms of local governments, such as the lack of geographical reach and the technical capacity to respond to watershed issues.⁴⁴¹ The compact includes non-governmental council members, fish and game clubs, environmentalists, conservationists, and other affected stakeholders.⁴⁴² The effect of the intermunicipal agreement is to organize and direct the staff professionals and volunteer technicians, as well as to provide needed data and policy direction to the individual legislative and land use bodies of the constituent localities.⁴⁴³

Proposition 1, the state government also made organizational changes to help smaller systems with funding and technical support, creating an Office of Sustainable Water Solutions. *Id.* at 18. *See generally id.* at 17 (discussing how addressing issues of water reliability and water contamination rely on funding).

436. *See infra* notes 437–54 and accompanying text.

437. N.Y. GEN. MUN. LAW § 119-o(1) (McKinney 2018); *see also* N.Y. GEN. CITY LAW § 20-G(1) (establishing cooperation across municipalities in regards to comprehensive planning and land use regulation); N.Y. TOWN LAW § 284(1) (McKinney 1993) (creating statutory authority for municipalities to “enter into agreements” with other governmental entities); N.Y. VILLAGE LAW § 7-741(1) (authorizing municipalities to cooperate with other local governmental entities).

438. *Moodna Creek Watershed*, ORANGE CTY. WATER AUTH., <http://waterauthority.orangecountygov.com/moodna.html> (last visited Dec. 27, 2019).

439. *Id.*

440. MOODNA CREEK WATERSHED INTERMUNICIPAL COUNCIL, OPERATING PROCEDURES 1 (2011), http://waterauthority.orangecountygov.com/PROJECTS/MOODNA_CREEK_WATERSHED/Moodna%20Creek%20Watershed%20Intermunicipal%20Council%20Operating%20Procedures.pdf.

441. *See id.* (stating the function of the Moodna Creek Watershed Intermunicipal Council and ways to address common watershed issues).

442. *See id.* at 5 (listing non-municipal members of the Council).

443. *See id.* at 1 (stating the function of the intermunicipal agreement).

The Council addresses issues that include: (A) “[s]ecuring and sharing the public and private grants available to address issues pertaining to watershed protection and management;” (B) “[u]tilizing each undersigned Parties’ ability to address issues pertaining to the Creek and its Watershed;” (C) “[c]reating an avenue for intermunicipal dialogue for addressing water quality and water quantity issues;” (D) “[c]onsidering implementation of the Moodna Creek Watershed Conservation and Management Plan;” (E) “[d]eveloping educational programs on watershed planning, flooding, pollution prevention, stormwater management, biological resources and other best management practices for individuals and municipalities;” (F) “[c]oordinating other organizational efforts in each municipality that impact or benefit the resources of the Moodna Watershed;” and (G) “[b]enefitting watershed Municipalities, individually and collectively, by integrating protection of watershed resources with economic and social policies.”⁴⁴⁴

Federal and state agencies can themselves encourage local governments to exercise their intermunicipal powers to protect water resources.⁴⁴⁵ Years of unchecked pollution and its adverse impact on Manhasset Bay on Long Island led to the signing of an intermunicipal agreement to preserve this shared environmental and economic resource.⁴⁴⁶ Signatories included ten villages, two towns, and Nassau County.⁴⁴⁷ It was the result of several years of work under programs of the U.S. Fish and Wildlife Service and the New York Department of State.⁴⁴⁸ The agreement recognized the interdependence of environmental conservation and economic activity across municipal lines and the need to collaborate intermunicipally to protect the Bay.⁴⁴⁹ Its goals are to:

444. *Id.*

445. *See infra* notes 446–54 and accompanying text.

446. John R. Nolon, *Grassroots Regionalism Through Intermunicipal Land Compacts*, 73 ST. JOHN’S L. REV. 1011, 1011–29 (1999) [hereinafter Nolon, *Grassroots Regionalism*].

447. *Id.* at 1029 n. 58.

448. *Id.*

449. *Id.* at 1028 n. 56. The parties entered into the intermunicipal agreement upon “recogniz[ing] the importance of Manhasset Bay as a vital coastal ecosystem essential to the environmental and economic well-being of the people in the surrounding communities and as a . . . significant coastal fish and wildlife habitat as noted by the U.S. Fish & Wildlife Service (1991) and the New York Department of State (1987 and 2005) . . . [The members to the Agreement] continue to be deeply concerned with the condition of Manhasset Bay and . . . the potential for further degradation due to the variety of pollutant sources, including but not limited to stormwater runoff, petroleum spills, industrial effluent, illegal dumping, floatable debris, [and] boat waste . . .” Inter-Municipal Agreement Between the County Of Nassau, the Town of North Hempstead, Village of Baxter Estates, Village of Flower Hill, Village of Great Neck, Village of Kensington, Village of Kings Point, Village of Manorhaven, Village of Munsey Park, Village of Plandome, Village of Plandome Heights, Village of Plandome Manor, Village of Port Washington North, Village of Sands Point, Village of Thomaston [hereinafter Manhasset Bay Agreement].

improve the water quality of Manhasset Bay so that all waters of the Bay will consistently meet water quality standards for bathing, swimming, and fishing; . . . improve the water quality of Manhasset Bay . . . so it will once again be classified as an area suitable for the harvesting of shellfish for human consumption; . . . restore and enhance the surrounding tidal wetlands that serve to cleanse ecosystems; provide marine food production and wildlife habitat; offer opportunities for education, research and recreation; provide flood and storm abatement; and offer open space and aesthetic appreciation; control and reduce point and nonpoint source pollution affecting the Bay and its environs; and . . . coordinate local coastal regulations so as to maximize protection and enhancement efforts to improve the quality of Manhasset Bay, its tributaries and wetlands.⁴⁵⁰

The agreement establishes the Manhasset Bay Protection Committee to coordinate efforts to protect and enhance the quality of the Bay and its watershed.⁴⁵¹ The Committee's function is not only to coordinate the involvement of the constituent municipalities, but to work with the relevant county, state, and federal agencies.⁴⁵² Representatives of each municipality serve on the Committee.⁴⁵³ It is empowered to act for these municipalities to secure New York State Department of State grant funds, hire environmental consultants, and jointly fund and implement the Manhasset Bay Local Waterfront Revitalization Program.⁴⁵⁴

F. Larger Regional Networks

At the larger, regional level, intergovernmental agreements can provide significant help to watershed stakeholders.⁴⁵⁵ The Chesapeake Bay Program, for example, is an interstate watershed partnership created to address watershed pollution issues in the multi-state Chesapeake Bay.⁴⁵⁶ The Program has a rich history of federal, state, and local effort and coordination,

450. *Id.*

451. Nolon, *Grassroots Regionalism*, *supra* note 446, at 1029.

452. *Id.*

453. *Id.*

454. *Id.*

455. *See infra* notes 456–63 and accompanying text.

456. *See Bay Program History*, CHESAPEAKE BAY PROGRAM (2019), https://www.chesapeakebay.net/who/bay_program_history (last visited Dec. 27, 2019) (explaining the history and purpose of the original Chesapeake Bay Agreement).

culminating with the Chesapeake Bay Watershed Agreement signed on June 16, 2014.⁴⁵⁷

The partnership consists of the states of Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia; the District of Columbia; the Chesapeake Bay Commission, a tristate legislative body; and the EPA, representing the federal government.⁴⁵⁸ Local governments have played a key role in the success of the Program because of the Program's commitment to involve, coordinate, and connect them with federal and state actors through the Local Government Engagement Initiative.⁴⁵⁹

The Program illustrates how federal and state actors can equip local governments with the tools and capacity they need to address water pollution concerns in large regional watersheds.⁴⁶⁰ The Agreement includes a commitment to proper stewardship of the Bay and its tributaries, focusing on education regarding the nature of the threats to water quality and strategies for addressing those threats.⁴⁶¹ It sees the involved local governments acting as stewards, assisting with necessary conservation and restoration efforts to achieve a healthy bay.⁴⁶² The stewardship goal is achieved through training and leadership programs for local officials to transfer knowledge among one another and from the involved civic organizations and state and federal agencies.⁴⁶³

G. Top-Down Required Collaboration

Federal legislation and agency regulations can operate from the top down to harness the resources of states while recognizing and guiding local

457. *Id.*

458. *About the Chesapeake Bay Program Office*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/aboutepa/about-chesapeake-bay-program-office> (last updated Apr. 15, 2019).

459. *See generally id.* (noting that several states, the Chesapeake Bay Commission, and the EPA all played roles in the Program's success).

460. CHESAPEAKE BAY PROGRAM, CHESAPEAKE BAY PROGRAM LOCAL ENGAGEMENT STRATEGY 2 (2019), https://www.chesapeakebay.net/channel_files/38201/cbp_local_engagement_strategy_final_draft_053019.pdf.

461. *See id.* at 4 (adding proper stewardship is achieved by educating citizens). Doing so creates "citizen stewardship," a local engagement need that must be satisfied to achieve the Program's watershed goals and objectives. *Id.*

462. *See id.* at 2 ("The purpose of this strategy is to present a road map to guide [non-governmental entities] in engaging with local government and local elected officials to provide knowledge and solicit support for the goals and outcomes of the Watershed Agreement.").

463. *See id.* at 4 (explaining Program workgroups oversee outcomes and "develop[] management strategies and logic and action plans detailing how each outcome will be met."). In doing this, the stewardship goal is better monitored, and goals can be met. *Id.*

governments to use their land use power to protect surface water quality.⁴⁶⁴ Under the authority of the CWA, the EPA adopted the Stormwater Management Program.⁴⁶⁵ Its goal is to improve the water quality of surface waters that receive stormwater runoff from discrete point sources.⁴⁶⁶ Localities that operate Municipal Separate Stormwater Sewer Systems (MS4s) must get a National Pollution Elimination Discharge System (NPDES) permit to discharge the effluent from their MS4s (a point source of pollution) into surface waters.⁴⁶⁷ States are encouraged to manage the required permitting system by adopting a State Pollution Discharge Elimination System (SPDES) permit to operate in lieu of its federal counterpart.⁴⁶⁸

The EPA's promulgation of the Stormwater Phase II Final Rule in 1999 significantly expanded the number of municipalities required to comply with stormwater control measures.⁴⁶⁹ To meet their MS4 general permit requirements under the CWA, MS4s must implement six minimum controls to reduce pollution caused by diffuse surface runoff.⁴⁷⁰ The controls include the following: (1) public education and outreach, (2) public participation and involvement, (3) illicit discharge detection and elimination, (4) construction site runoff control, (5) post-construction runoff control, and (6) pollution prevention and good housekeeping.⁴⁷¹

The requirements to control construction site runoff and post-construction runoff require local governments that operate MS4s to exercise their land use authority through zoning and site plan regulation to comply

464. See U.S. ENVTL. PROT. AGENCY, COMMUNITY SOLUTIONS FOR STORMWATER MANAGEMENT: A GUIDE FOR VOLUNTARY LONG-TERM PLANNING—DRAFT 1 (2016) (footnote omitted), https://www.epa.gov/sites/production/files/2016-10/documents/draftlongtermstormwaterguide_508.pdf (“The [EPA] is introducing this voluntary guide to lay out a path forward that any community can use to facilitate cost-effective, sustainable and holistic solutions that protect human health and manage stormwater as a resource.”).

465. *Proposed National Rulemaking to Strengthen the Stormwater Program*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/npdes/proposed-national-rulemaking-strengthen-stormwater-program#info> (last visited Dec. 27, 2019).

466. See U.S. ENVTL. PROT. AGENCY, EPA 833-F-07-010, EVALUATING THE EFFECTIVENESS OF MUNICIPAL STORMWATER PROGRAMS 1–2 (2008) [hereinafter U.S. ENVTL. PROT. AGENCY, EVALUATING THE EFFECTIVENESS], https://www3.epa.gov/npdes/pubs/region3_factsheet_swmp.pdf (adding that the EPA has set explicit goals to evaluate effectiveness of municipal stormwater programs).

467. See *id.* (highlighting how the EPA stormwater regulations require localities operating MS4s to get a NPDES permit).

468. See *id.* at 2 (noting that states are often encouraged to set up their own systems, using the EPA's NPDES permit conditions as a basic guideline).

469. Stormwater Phase II, 64 Fed. Reg. 68,722 (Dec. 8, 1999).

470. U.S. ENVTL. PROT. AGENCY, EPA 833-F-00-001, STORMWATER PHASE II FINAL RULE, AN OVERVIEW: WHY IS THE PHASE II STORMWATER PROGRAM NECESSARY? (2005), <https://www.epa.gov/sites/production/files/2015-11/documents/fact1-0.pdf>.

471. *Id.*

with the controls required by the permitting system.⁴⁷² The EPA and state environmental agencies provide guidelines and materials to help municipalities comply.⁴⁷³ A key focus of this program is to improve water quality by minimizing erosion and sediment pollution during and after soil disturbance activities, i.e., construction.⁴⁷⁴ Localities can adopt practices to restrict the volume of water flow and slow the speed of water runoff to reduce soil erosion and other surface water pollution.⁴⁷⁵

H. Collaborative Subsidiarity and Local Land Use Power

There are several lessons taught by these examples:⁴⁷⁶

(1) Local governments often know their own limitations.⁴⁷⁷ Cannon Township reached out to its county for assistance in watershed management, and the City of Boulder preserved threatened natural resources in cooperation with Boulder County.⁴⁷⁸

(2) Localities are willing to collaborate with a variety of partners, including county and state agencies, their municipal neighbors, and non-governmental stakeholders.⁴⁷⁹

(3) States use a number of methods to fill jurisdictional, political, and technical gaps at the local level.⁴⁸⁰ States encourage intermunicipal cooperation; provide data, maps, and model laws; adopt new enabling statutes; and require local action to achieve state objectives like climate

472. *See id.* at 1 (explaining that the EPA's Stormwater Phase II Program and permitting system "expands the Phase I program by requiring additional operators of MS4s in urbanized areas and operators of small construction sites, through the use of NPDES permits, to implement programs and practices to control polluted stormwater runoff").

473. *See id.* (highlighting the Phase II Stormwater Program that serves as a guideline to increase municipality compliance).

474. *See Erosion & Sedimentation Best Management Practices*, *supra* note 326 (outlining best management practices to prevent soil erosion); *see also* PA. DEP'T OF ENVTL. PROT., ALTERNATIVE E&S AND PCSM BMPs 1 (2019) (discussing programs to minimize soil erosion and control sediment pollution).

475. *See ROUGE RIVER NAT'L WET WEATHER DEMONSTRATION PROJECT*, *supra* note 327 (listing some "structural, vegetative or managerial practices used to treat, prevent or reduce water pollution").

476. *See infra* notes 477–86 and accompanying text.

477. *See CANNON TWP., MASTER PLAN UPDATE*, *supra* note 417, at 4 (stating the goal to "establish . . . a working partnership with the Kent County Health Department, Michigan Department of Environmental Quality, and other applicable local, state, and federal environmental agencies to ensure that the quality and quantity of water available to Township residents is acceptable").

478. *See supra* notes 417–25 (explaining that Cannon Township reached out to its county for assistance, and the City of Boulder cooperated with Boulder County to preserve threatened natural resources).

479. *See* U.S. ENVTL. PROT. AGENCY, EVALUATING THE EFFECTIVENESS, *supra* note 466 (discussing state, federal, and agency cooperation in stormwater programs).

480. *See supra* Parts IV.D–E.

change mitigation.⁴⁸¹ The Manhasset Bay example shows how state and federal agencies can operate as partners to encourage localities to use their authority to protect a shared water resource.⁴⁸²

(4) Municipalities can integrate their actions vertically and horizontally.⁴⁸³ In the Moodna Creek Watershed, two dozen local governments reached across municipal and sectoral lines and up to higher levels of government for support and technical assistance.⁴⁸⁴

(5) Using many of the mechanisms employed at smaller scales, interstate networks of governmental and other sectoral agencies can be created that operate effectively at much larger regional levels, such as the Chesapeake Bay Program.⁴⁸⁵

(6) The federal government can create nested hierarchies where federal standards are incorporated into state regulations that govern permits needed by local governments that then use their land use power to manage stormwater.⁴⁸⁶

It is notable that in most of these examples, the collaborations succeed because they are bottomed on local action, buoyed by respect for local governments, and strengthened by the knowledge and commitment of municipal leaders who are closest to and most immediately affected by threats to water quality and other natural resources.⁴⁸⁷

V. TOWARD A PRINCIPLE OF COLLABORATIVE SUBSIDIARITY

A. De Facto Localism and Its Theoretical Supporters

Despite its critics, land use control remains firmly in the hands of local governments.⁴⁸⁸ Through land planning, zoning, and other land use regulations, they determine the use of the land within their jurisdictions.

481. *See supra* Parts IV.D–E.

482. *See* Manhasset Bay Agreement, *supra* note 449 and accompanying text (discussing the Manhasset Bay Project and its goals to collaborate with state and federal agencies to reach water quality goals).

483. *See supra* Part IV.E.

484. *See Moodna Creek Watershed*, *supra* note 438 (discussing Moodna Creek’s cooperation and outreach to higher governmental entities for watershed efforts).

485. *See Bay Program History*, *supra* note 456 (chronicling the success of Chesapeake Bay Program because of governmental and sectoral agency collaboration to operate at larger regional levels).

486. *See* U.S. ENVTL. PROT. AGENCY, EVALUATING THE EFFECTIVENESS, *supra* note 466 (discussing state, federal, and agency cooperation in stormwater programs).

487. *See supra* notes 477–86 and accompanying text.

488. *See e.g.*, Craig Anthony Arnold, *The Structure of the Land Use System in the United States*, 22 J. OF LAND USE & ENVTL. L. 441, 486 (2007) (footnote omitted) (“The land use regulatory system is located primarily at the local level of governance and decision making in the United States, despite the rise of federal and state statutes and regulations that govern certain aspects of land use.”); Ashira Pelman

[U]nder localism, the crucial power center is at the tip of the shovel, where the actual work is being done. Expertise is not in the think tanks but among those who have local knowledge, those with a feel for how things work in a specific place and an awareness of who gets stuff done.⁴⁸⁹

Because of their unique position, “localized governments will have a better grasp of local conditions and issues.”⁴⁹⁰ “With broad authority for local decision-making delegated to the local level, such municipal governments often ‘play a vital governance role,’ with responsibility for ‘drinking water’”⁴⁹¹ “Local land use and zoning laws offer one of the most effective opportunities to create more resilient patterns of development.”⁴⁹²

Chapter Twelve of the Intergovernmental Panel on Climate Change’s (IPCC) Fifth Assessment Report addresses the relationship between the shape of human settlements and climate change mitigation.⁴⁹³ To mitigate climate change, the IPCC focuses heavily on urban form, infrastructure, and mixed land use.⁴⁹⁴ The Chapter discusses many of the land use strategies that local governments are using to mitigate climate change.⁴⁹⁵ It notes that mixed-use neighborhoods shape development to reduce the amount of CO₂ through the efficient use of energy and the reduction of vehicle trips and auto emissions.⁴⁹⁶ Additional strategies mentioned include density regulations, urban containment instruments, building codes, parking regulations, design regulations, and affordable housing mandates.⁴⁹⁷ The Chapter discusses land acquisition and management through the transfer of development rights and

Ostrow, *Land Law Federalism*, 61 EMORY L. J. 1397, 1404 (2012) (“[T]he dominant descriptive and normative account of land-use law is premised upon local control.”).

489. David Brooks, *The Localist Revolution*, N.Y. TIMES (July 20, 2018), <https://www.nytimes.com/2018/07/19/opinion/national-politics-localism-populism.html>.

490. See David Owen, *Cooperative Subfederalism*, 9 U.C. IRVINE L. REV. 177, 213 (2018) (footnote omitted) (quoting a land use attorney in Oregon saying that the city council, planning commission, and city staff are the ones who community members see at the Rotary Club meetings, in church, and at the store).

491. See Adams-Schoen, *supra* note 400, at 192 (footnote omitted) (describing “[t]he [e]ssential [l]ocal [r]ole in [c]reating [c]limate [r]esilient [c]ommunities”).

492. *Id.* (footnote omitted).

493. See IPCC, CLIMATE CHANGE 2014: MITIGATION OF CLIMATE CHANGE. CONTRIBUTION OF WORKING GROUP III TO THE FIFTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 927 (Ottmar Edenhofer et al. eds., 2014) (emphasis omitted), https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_full.pdf (“Infrastructure and urban form are strongly linked, especially among transportation infrastructure provision, travel demand and vehicle kilometres travelled.”).

494. *Id.* at 22–24.

495. *Id.* at 927.

496. *Id.* at 978.

497. *Id.* at 73–92, 1161.

increasing green space and urban carbon sinks.⁴⁹⁸ The IPCC Chapter Twelve is based on recognizing the grassroots theories.⁴⁹⁹

The Paris Agreement on combating climate change also endorsed the role of local governments in mitigating climate change and invited their participation in the international agreement by memorializing bottom-up strategies, such as Nationally Determined Contributions, to climate change mitigation.⁵⁰⁰ This approach broadened international climate policy by including state and local government actors and inviting them to demonstrate how they can contribute.⁵⁰¹

Scholars in several disciplines endorse land use localism, that is, grassroots strategies for responding to societal problems related to the use of the land.⁵⁰² Yale law professor Robert C. Ellickson, for example, warns against the “Yale . . . disease,” which he calls the propensity of his law school students to look entirely to federal laws and federal courts for solutions, causing them to ignore or not understand state and local solutions.⁵⁰³ He refers to the principle of subsidiarity, which “holds that responsibility for dealing with a problem should be delegated to the most decentralized institution capable of handling that problem.”⁵⁰⁴ Dr. Elinor Ostrom advanced a polycentric approach to governance and warned against the “panacea

498. *Id.* at 963–64.

499. *Id.* at 978.

500. *See* Conference of the Parties’ Twenty-First Session, U.N. Framework Convention on Climate Change, *Adoption of the Paris Agreement*, ¶¶ 12–21 U.N. Doc. FCCC/CP/2015/L.9/Rev.1 (Dec. 12, 2015) (applying Nationally Determined Contributions to a global climate agreement).

501. Nolon, *Low Carbon Land Use*, *supra* note 263, at 671.

502. This Article focuses on scholarship regarding “land use localism,” limiting itself to the role of local government as it exercises its delegated authority to control private land development and protect the physical environment under its police power. *See infra* Part V.A. In the field of localism generally, context matters. How broadly municipal powers are interpreted and what powers are likely to be preempted by state legislation, for example, depends on the context. With respect to land use, municipal governments depend on their land use authority to create land uses that they are authorized to tax to raise revenue to discharge their obligations to provide public services and infrastructure. *See infra* Part III. In this context, there is more deference to local legislative and administrative acts than in others, such as regulating paper bags, Styrofoam containers, communications systems, firearms, soda beverages, or tobacco. Schragger, *supra* note 233, at 27.

503. ELLICKSON, *supra* note 35, at 275.

504. *Id.* at 274; *See* Brooks, *supra* note 489 (“Localism is the belief that power should be wielded as much as possible at the neighborhood, city and state levels.”).

trap[],”⁵⁰⁵ which is akin to the Yale disease.⁵⁰⁶ A panacea trap occurs where responsible actors believe there is a cure-all solution applicable to every environmental issue, regardless of the local circumstances.⁵⁰⁷ She, too, would assign key decision-making responsibility to those who are as close as possible to the scene of relevant events.⁵⁰⁸

All change related to land use manifests itself at the local level, and it is there that land use plans and regulations need to be changed to reorder human settlements.⁵⁰⁹ Sociologists study how change happens.⁵¹⁰ One term for what they observe is the “diffusion of innovation[],” a term which was popularized by Dr. Everett Rogers.⁵¹¹ Diffusion, he notes, includes the planned and spontaneous spread of new ideas, such as methods of containing sprawl, implementing measures to mitigate climate change, or to protect water quality.⁵¹² Scholars who study diffusion theory observe how change happens in social systems and document the processes by which successful change occurs.⁵¹³ Their focus is on connectivity.⁵¹⁴ They observe that outside “change agents,” perhaps state or federal officials, are most successful when

505. See Elinor Ostrom et al., *Going Beyond Panaceas*, 104 PROC. NAT’L ACAD. SCI. 15176, 15176 (2007) (discussing the “panacea trap[],” the notion of believing one system of governance applies to all environmental problems). We dedicate this report to the memory of Elinor Ostrom, Professor of Political Science at Indiana University and Nobel Laureate in Economics. *Elinor Ostrom: Facts, THE NOBEL PRIZE*, <https://www.nobelprize.org/prizes/economic-sciences/2009/ostrom/facts/> (last visited Dec. 31, 2019). Her work provided a fundamental contribution to the understanding of collective action, trust, and cooperation in the management of common pool resources, including the atmosphere. *Id.* She launched a research agenda that has encouraged scientists to explore how a variety of overlapping policies at city, national, regional, and international levels can enable humankind to manage the climate problem. See IPCC, *supra* note 493, at ix (dedicating a “report [that] assesses mitigation options at different levels of governance and in different economic sectors” to Elinor Ostrom). The assessment of climate change mitigation across different levels of governance, sectors and regions has been a new focus of the Working Group III contribution to AR5. See generally *id.* We have benefited greatly from the vision and intellectual leadership of Elinor Ostrom.

506. Ostrom et al., *supra* note 505, at 15176.

507. See *id.* (discussing the cure-all solution presented by “panacea traps”).

508. *Id.* at 15176.

509. Brooks, *supra* note 489 (“Localism is the belief that power should be wielded as much as possible at the neighborhood, city and state levels.”).

510. Theo S. Dunfee, *What Is Social Change and Why Should We Care?*, S.N.H. UNIV. (May 29, 2019), <https://www.snhu.edu/about-us/newsroom/2017/11/what-is-social-change>.

511. EVERETT M. ROGERS, *DIFFUSION OF INNOVATIONS* 5 (5th ed. 2003).

512. *Id.* at 6.

513. See e.g., David E. Booher & Judith E. Innes, *Network Power in Collaborative Planning*, J. PLAN. EDUC. & RES. 221, 225 (2002).

514. See John R. Nolon, *Champions of Change: Reinventing Democracy Through Land Law Reform*, 23 PACE ENVTL. L. REV. 905, 916 (2006) [hereinafter Nolon, *Champions of Change*] (explaining scholars who study diffusion theory observe how change happens in social systems, and because “[c]onnectivity” among components in social systems is the key to successful adaptation and change, scholars focus on horizontal and vertical partnerships).

they place new tools in the hands of respected local leaders.⁵¹⁵ With respect to land use localism, most supportive theorists recognize the need for collaboration with higher levels of government, neighboring communities, and the civic and private sectors.⁵¹⁶ Diffusion theorists, in addition to emphasizing the role of outside idea sources, note that as successful change occurs in one community, it tends to spread to nearby places confronting similar problems.⁵¹⁷

In the study of urban planning, researchers describe how local and regional planning networks can be created to link local responses to address common, transboundary problems.⁵¹⁸ “Urban planning scholars reference the behavior of complex adaptive systems and the field of diffusion of innovations to define how regional planning networks can work to rationalize land use planning and control.”⁵¹⁹ According to David E. Booher and Judith E. Innes,

[n]etwork power emerges from communication and collaboration among individuals, public and private agencies, and businesses in a society. Network power emerges as diverse participants in a network focus on a common task and develop shared meanings and common heuristics for action. The power grows as these players identify and build on their interdependencies to create new potential. In the process, innovations and novel responses to environmental stresses can emerge. These innovations in turn make possible adaptive change and constructive joint action.⁵²⁰

David Barron argues that

local autonomy is a more complex concept than we often acknowledge The baseline problem arises because no city or state is an island jurisdiction. The ability of each locality to make effective decisions on its own is inevitably shaped by its relation to other cities and states, by its relation to broader, private market

515. *Id.* at 914.

516. *Id.* at 916.

517. *Id.*; *see also* COMPREHENSIVE PLAN FOR THE VILLAGE OF BANNOCKBURN, *supra* notes 283, at 1 (highlighting the Village of Bannockburn has maintained a successful system of its surrounding communities by laying a foundation of “sound land-planning principles”).

518. *See* Nolon, *Low Carbon Land Use*, *supra* note 263, at 668 (discussing how urban planning can address transboundary problems).

519. *See* Nolon, *Champions of Change*, *supra* note 514, at 915 (discussing land use planning and control in reference to complex adaptive systems).

520. Booher & Innes, *supra* note 513, at 225 (footnote omitted) (Network power “it is a jointly held resource enabling networked agencies or individuals to accomplish things they could not otherwise.”)

forces and, most importantly, by the way the central power structures these relations⁵²¹

He states “that the role of central government should not be to supplant local decisionmaking so much as to encourage local jurisdictions to understand their role as components of a larger coordinated system that benefits from cooperative interlocal behavior.”⁵²²

Barron and Frug argue that regionalists should aim “to enable cities and towns to participate in the resolution of regional problems. In this way, regionalism could offer an attractive— even empowering—alternative to the form of local power that now exists.”⁵²³ “The main point we wish to underline, therefore, is a conceptual one. Local autonomy is not the problem”⁵²⁴ “Opportunities may arise, therefore, for collective efforts to seek increased local power that the state need not fear. In return, the state need ask only that these new powers be exercised with regional interests in mind.”⁵²⁵ Barron and Frug argue that advocates for regional solutions to governmental problems “should take the desire for local control more seriously, not less.”⁵²⁶

David Owen focuses his support for local control one rung up on the governmental ladder—what he calls subfederalism, targeting state agencies as preferred collaborators. Under this approach, he writes that “state and local governments can work together in ways that bring the benefits of local knowledge up to state levels.”⁵²⁷ His research rejects the idea of intergovernmental separation where each government—local, state, and federal—operates in its carved out, autonomous space.⁵²⁸ Instead, he learns from participants of state-local case studies that they credit success to “robust

521. David J. Barron, *A Localist Critique of the New Federalism*, 51 DUKE L.J. 377, 378–79 (2001) (footnotes omitted).

522. *Id.* at 432.

523. David J. Barron & Gerald E. Frug, *Defensive Localism: A View of the Field from the Field*, 21 J.L. & Pol. 261, 262 (2005). To explain, the authors note that municipalities pursue local economic development because it “is the only interest municipalities can plausibly pursue given the state-designed structure of local power and the reality of inter-local competition for private investment.” *Id.* at 265 (footnote omitted). They define “defensive localism” as follows: “Our findings suggest that many local residents are practicing what we call ‘defensive localism,’ a form of local power that arises as much from being constrained as from being empowered.” *Id.* at 270. It “is a form of active engagement that is spurred by a feeling of not being in control.” *Id.* at 271.

524. *Id.* at 290.

525. *Id.* at 291.

526. *Id.* at 262.

527. Owen, *supra* note 490, at 226.

528. *Id.*

and continuous systems of interaction, to . . . major state investments in both empowering and supporting—as well as demanding—local governance.”⁵²⁹

Ashira Pelman Ostrow observes that, “[i]n contrast to federal bureaucrats, local officials are literally on the ground. Local officials, who are a part of the local community and are politically accountable to it, have the nuanced knowledge and local sensibilities necessary to regulate land.”⁵³⁰ In his article on cooperative localism, Nestor Davidson reinforces Ostrow’s emphasis on the local-federal connection. He

proposes a new framework for conceptualizing federal empowerment of local governments The Court in its modern federalism jurisprudence has built a largely instrumental case for devolving and decentralizing governmental power These core instrumental concerns are served even more forcefully by enhancing the autonomy of local governments. Thus, the very values of federalism that the Court invokes to enhance state sovereignty provide a compelling case for the particular exercise of federal authority represented by cooperative localism—in essence, a localist grounding for national power.⁵³¹

Davidson highlights how “[d]irect federal-local relations merit continued judicial respect.”⁵³² Given the critical importance and ubiquitous

529. *Id.* at 218 (footnote omitted). This reference by Owen to state “demanding” is important. *Id.* Despite this Article’s deference to localism, there are instances in which state and federal governments must assert their overriding interests and take action to effectively influence local behavior. *See, e.g.*, Adam Millsap, *When States Should Preempt Local Governments*, FORBES (Mar. 6, 2018), <https://www.forbes.com/sites/adammillsap/2018/03/06/when-states-should-preempt-local-governments/#7ca026881ece> (outlining some “legitimate reasons for more state oversight of local zoning”). This is the case with respect to the nation’s housing affordability and fair housing crisis. *See* NAT’L LOW INCOME HOUS. COAL., SOLUTIONS TO THE AFFORDABLE HOUSING CRISIS (2019), <https://nlihc.org/sites/default/files/Solutions-to-the-Affordable-Housing-Crisis.pdf> (suggesting federal solutions to address the affordable housing crisis). In this highly inflamed context, local decision-makers need cover and guidance, at a minimum, to approve affordable housing projects. States or the federal government must assess housing needs and take steps toward allocating responsibility to localities for their proportionate share of those needs. Financial incentives to offset the local costs of needed infrastructure and public services are also needed. This type of robust intervention in local decision-making is not required to encourage local governments to preserve and protect their drinking water, for example. *See, e.g.*, NYC DEP’T OF ENVTL. PROT., NEW YORK CITY 2018 DRINKING WATER SUPPLY AND QUALITY REPORT 4 (2018), <https://www1.nyc.gov/assets/dep/downloads/pdf/water/drinking-water/drinking-water-supply-quality-report/2018-drinking-water-supply-quality-report.pdf> (explaining New York City’s “water quality monitoring program” is “far more extensive than required by [state and federal] law”). Context matters.

530. Ostrow, *supra* note 488, at 1442.

531. Nestor M. Davidson, *Cooperative Localism: Federal-Local Collaboration in an Era of State Sovereignty*, 93 VA. L. REV. 959, 961–62 (2007).

532. *Id.* at 963.

practice of local government involvement in national policies, it is well past time for a firmly-grounded jurisprudence of cooperative localism.⁵³³

B. Opposition to Exclusive Localism

Despite *de facto* local control of land use and its supportive theories, untethered land use localism has many critics.⁵³⁴ In addition to pointing to the limited technical capacity, resources, and geographical reach of local governments, critics note that municipal governments are susceptible to collective action problems,⁵³⁵ and municipal governments neglect to take into account the external impacts of their actions.⁵³⁶ Others lament the lack of local government accountability for the effect of local actions on larger-scale contexts.⁵³⁷ Negative views of local autonomy in land use matters arise in the context of climate change adaptation,⁵³⁸ watershed management,⁵³⁹ and species and habitat loss, among others.⁵⁴⁰ These perspectives lead some scholars to the conclusion that transboundary land use issues require control of local actions by higher levels of government.⁵⁴¹

533. *Id.* at 964.

534. See Alice Kaswan, *Climate Adaptation and Land Use: The Vertical Axis*, 39 COLUM. J. OF ENVTL. L. 390, 392 (2014) (“[A] multilevel governance approach that supplements local control with federal parameters and resources is necessary”); Davidson, *supra* note 531, at 961 (“This Article proposes a new framework for conceptualizing federal empowerment of local governments”); Robert Glicksman, *Climate Change Adaptation: A Collective Action Perspective on Federalism Constraints*, 40 ENVTL. L. 1159, 1174 (2010) (“The fact that states and localities have traditionally played a dominant role in controlling land use and water allocation does not mean they will or should continue to do so”); A. Dan Tarlock, *The Potential Role of Local Governments in Watershed Management*, 20 PACE ENVTL. L. REV. 149 (2002) (opposing strict localism and arguing the necessary involvement of higher levels of government).

535. See Kaswan, *supra* note 534, at 430–32, 437 (arguing that local governments fail to overcome the collective action barrier because of inadequate information, insufficient funding, a “race to the bottom” mentality, and potential benefits from their free rider status).

536. *Id.* at 432–36.

537. See Nestor M. Davidson, *The Dilemma of Localism in an Era of Polarization*, 128 YALE L.J. 954, 977 (2019) (“And local policies often generate externalities and spillover effects not fully accounted for by local governments.”). Davidson labels these “pathologies of localism.” *Id.* n. 88.

538. See Glicksman, *supra* note 534, at 1174–78 (describing how traditional state and local control of land use and water allocation lead to tensions when federal authority over these areas grows); Kaswan, *supra* note 534 at 392–93, 418, 436–40, 460 (arguing that local governments are ill-equipped to address climate change and instead advocating for a multilevel governance structure in which local land use regulations are augmented by state and federal regimes).

539. See generally Tarlock, *supra* note 534 (describing the history of federal supremacy in environmental protection of watersheds and arguing for improved cooperation with local governments.).

540. See John Harte, *Land Use, Biodiversity, and Ecosystem Integrity: The Challenge of Preserving Earth’s Life Support System*, 27 ECOLOGY L.Q. 929, 994–96 (2001) (recounting issues with application of the Endangered Species Act restricting local land use practices).

541. See *supra* notes 469–75 and accompanying text.

Ostrow notes that, “[i]n a world where capital and information flow freely across [increasingly porous jurisdictional] boundaries, few regulatory matters can be cabined within the jurisdictional lines of a single state, let alone a single locality.”⁵⁴² Viewed from the federal level, local land use functions can be seen as woven into a thickening national law fabric. She argues that there is an extensive “body of [existing] federal land law,” describing the role of local officials in this context as that of “federal agents.”⁵⁴³

Sarah J. Adams-Schoen is particularly critical of the ability of local governments to adapt to climate change.⁵⁴⁴ “However, because of various intractable technical and socio-political obstacles—which could also be characterized as ‘super wicked’ attributes of this policy problem—robust resilience lawmaking is largely unrealized at the local level. Moreover, many local governments continue to allow or even encourage patterns of development that magnify the risks.”⁵⁴⁵

C. Support for Collaborative Localism

Despite this relatively harsh criticism, there is a discernible movement toward taking a polycentric approach to solving shared environmental problems—even climate change—that requires the involvement of actors at all levels of government, including municipalities.⁵⁴⁶ Even advocates of top-down solutions support robust local involvement in land use control.⁵⁴⁷ Ostrow, for example, espouses a theory of land law federalism within which

542. Ostrow, *supra* note 488, at 1400 (footnote omitted).

543. *Id.* at 1402, 1403, 1437 (footnote omitted) (“Building upon the theoretical framework developed in Part II, Part III takes up a basic question of federalism: How should authority be allocated between the national government and its subnational units?”).

544. *See* Adams-Schoen, *supra* note 400, at 191 (describing the need for resiliency in local lawmaking).

545. *Id.* at 191 (footnotes omitted).

546. “Given the complexity and changing nature of the problems involved in coping with climate change, there are no ‘optimal’ solutions that can be used to make substantial reductions in the level of greenhouse gases emitted into the atmosphere. A major reduction in emissions is, however, needed. The advantage of a polycentric approach is that it encourages experimental efforts at multiple levels, as well as the development of methods for assessing the benefits and costs of particular strategies adopted in one type of ecosystem and comparing these with results obtained in other ecosystems. A strong commitment to finding ways of reducing individual emissions is an important element for coping with climate change. Building such a commitment, and the trust that others are also taking responsibility, can be more effectively undertaken in small- to medium-scale governance units that are linked through information networks and monitoring at all levels.” Elinor Ostrom, *A Polycentric Approach for Coping with Climate Change*, 15-1 ANNALS OF ECON. AND FIN. 97, 124 (2014).

547. Ostrow, *supra* note 488, at 1402 (discussing the need for federal law and local governance regarding land use control).

federal law and agencies provide the support local officials need.⁵⁴⁸ She notes that states are relatively absent in land use law, inviting “federalism theorists to explore the boundaries of a federal-local relationship.”⁵⁴⁹ She is highly critical of the inadequate jurisdictional reach of local governments, yet recognizes that local officials “have detailed knowledge of the land and are politically accountable to the local community, to implement land-use policy at the local level.”⁵⁵⁰

Cooperative subfederalism, advocated by David Owen, on the other hand, suggests that states have distinct and powerful potential to support local land use policy and programs.⁵⁵¹ Among the advantages he sees are that a state-local partnership “provides promising mechanisms for facilitating inter-local collaboration, countering interest group influence, and bolstering the financial resources available to local government, all while retaining key benefits of localism.”⁵⁵² Based on his extensive interviews with practitioners involved in state-local collaborations, he concludes that “experienced practitioners of cooperative subfederalism agreed, almost unanimously, that it offers a promising balance of state and local authority.”⁵⁵³

Adams-Schoen agrees.⁵⁵⁴ She advocates for a strong state-local partnership, referencing Richard Briffault’s scholarly work, which urges scholars “to give greater attention to the state as a political and legal focal point in the system of local governments.”⁵⁵⁵ Adams-Schoen reviews recent New York statutes and regulations and concludes that “state lawmaking can and should help local governments use local lawmaking authority to comprehensively and proactively adapt communities to climate- and

548. *Id.* at 1403 (discussing how agencies can help local officials to administer federal law).

549. *Id.* at 1403.

550. *Id.* at 1404 (“Local implementation of a federal land-use policy is likely to produce individual decisions that are consistent with national priorities but sensitive to the local context.”).

551. Owen, *supra* note 490, at 182 (“Drawing upon a focused review of three cooperative subfederalism programs, it considers whether cooperative subfederalism offers a promising governance model and how it can succeed.”). Owen is concerned about traditional federalism theory which tends to recommend carving out “spaces in which states can act without federal interference. It is in that autonomous space, both the Court and commentators often opine, that allows states to serve as democracy’s laboratories, check the power of the center, and compete for mobile citizens.” *Id.* at 217 (footnotes omitted).

552. *Id.* at 216.

553. *See generally id.* (footnote omitted) (claiming state agencies are needed to mediate inter-local disputes, provide local officials with guidance and cover, offer funding, and make technical support available to staff).

554. *See* Adams-Schoen, *supra* note 400, at 190 (outlining her thesis in which she argues a partnership between state lawmaking and local governments).

555. *See id.* at 187 n. 1 (citation omitted) (quoting Richard Briffault’s work, which details localism in practice).

weather-related risks.”⁵⁵⁶ Her work adds a fourth case study to the three that Owen examined.⁵⁵⁷

She explains how the New York Community Risk and Resiliency Act of 2014 is helping local governments overcome barriers to effective action.⁵⁵⁸ The Act requires state agencies to provide sea level rise inundation data and maps to coastal communities so that they can track and assess risks in particularly vulnerable neighborhoods; it also requires state agencies to provide model laws to help them retreat from or accommodate those risks.⁵⁵⁹ She reviews with favor the state’s amendment of its environmental impact review regulations to require local governments to review the impact of climate change on land use projects that it approves, as well as to assess the impact of those projects on climate change.⁵⁶⁰ Because New York’s environmental impact review law applies to local governments and requires them to mitigate the adverse environmental impacts of their actions, these regulatory amendments “may turn out to be one of the most effective features of the state’s adaptation regime.”⁵⁶¹

Alice Kaswan, the author of many critiques of localism, understands the key role that local governments play.⁵⁶² Her concern focuses on local governments acting in isolation such that their unassisted initiatives “are unlikely to provide a sufficient national response to the dramatic risks ahead.”⁵⁶³ She recommends that “by creating links between local, federal (and possibly state) programs, multilevel governance provides an opportunity for dynamic engagement among levels of government. Such engagement could prompt federal, state, and local dialogue, dialogue that could lead to more carefully considered and effective regulatory outcomes.”⁵⁶⁴

Kaswan opposes exclusive local control, while demonstrating the benefits of her multilevel framework.⁵⁶⁵ “Shared governance can best serve

556. *Id.* at 215 (footnote omitted).

557. *See id.* at 191 (discussing a case study regarding the New York Community Risk and Resiliency Act of 2014).

558. *See id.* (discussing New York’s Community Risk and Resiliency Act of 2014, which helps local governments address governance challenges from climate-related risks); Community Risk and Resiliency Act, 2014, N.Y. LAWS 1115-19.

559. N.Y. LAWS 1115-19.

560. Adams-Schoen, *supra* note 400, at 216–20.

561. *Id.* at 238.

562. Kaswan, *supra* note 534, at 394 (understanding the role of local governments, but arguing for state and federal involvement).

563. *See id.* at 393 (stating that local government initiatives are insufficient compared to national initiatives and responses).

564. *Id.* at 438 (footnote omitted).

565. *See Id.* at 474 (stating that a multilevel framework is more beneficial than exclusive local governance).

the range of values informing government structures. They demonstrate that, whatever the limitation of exclusive local control, a continued and substantial local role remains critical.”⁵⁶⁶ “While local governments are unlikely to give up their autonomy easily, federal involvement could provide local governments with real benefits: coordination, financial and technical assistance, and even some alleviation of responsibility.”⁵⁶⁷

CONCLUSION

There is general consensus among the theorists discussed above that, with respect to land law localism: (1) local governments play an essential role in land use problem solving;⁵⁶⁸ (2) local governments must be meaningfully involved in strategic planning and implementation;⁵⁶⁹ (3) there are several limitations to local governments’ ability to solve problems;⁵⁷⁰ (4) to solve complex land use problems, they need assistance, guidance, and direction;⁵⁷¹ (5) the assistance should be responsive to local needs;⁵⁷² and that (6) for this to happen, higher levels of government at the regional, state, or federal level must collaborate with locals in solving larger-scale land use problems.⁵⁷³

There is little consensus, however, about who, precisely, the preferred collaborators are and how collaborations should be structured.⁵⁷⁴ The possibilities range from inter-municipal partnerships to collaborations with regional, state, or federal agencies, or some combination of them.⁵⁷⁵

The principle of subsidiarity “holds that responsibility for dealing with a problem should be delegated to the most decentralized institution capable of handling that problem.”⁵⁷⁶ There is a single actor implication in this

566. *Id.* at 474.

567. *Id.* at 476.

568. *See supra* Part II (discussing the role of local governments in solving issues of land use).

569. *See supra* Part III.C (discussing the need to implement local planning in land use control).

570. *See Kaswan, supra* note 534, at 429, 430 (discussing the limitations of local governments to solve problems).

571. *See supra* Part IV.H (discussing the lessons of collaborative subsidiarity and local governing power); *see also Kaswan, supra* note 534, at 469 (emphasizing that federal and state assistance is necessary for local governments to address land use issues).

572. *See supra* Part V.A (discussing broadly the value of local and regional governance to address local needs).

573. *See supra* Part V.C (discussing the need for collaborative localism).

574. *See supra* Part IV (discussing various collaborations, the method of which is dependent upon the specific local need).

575. *See supra* Part IV (discussing various models of collaboration ranging from bottom-up intergovernmental cooperation, state-created intermunicipal initiatives, top-down collaboration, to collaborative subsidiarity).

576. ELLICKSON, *supra* note 35, at 274.

phrasing, and it begs a question regarding the capacity of the decentralized institution. Complex land use issues like the protection of water quality always engage local people and their governments, since that is where the problems manifest themselves. Nearly all local governments have been delegated significant legal authority from their state legislatures to adopt the types of strategies reviewed in Part IV of this Article.⁵⁷⁷ Even with that capacity and numerous model actions to choose from, they regularly form partnerships with one or more regional, state, or federal agencies to supplement their ability to deal with the problem.⁵⁷⁸ In other words, they reject the single actor implication of the principle and instinctively collaborate with other agencies to supplement their parochial capacity. In so doing, they embrace a principle of collaborative subsidiarity.⁵⁷⁹

Further, they choose various partners depending on the circumstances of the land use problem they confront and the resources that each can provide.⁵⁸⁰ The theorists of collaborative subsidiarity, if we can call them that, tend to favor one collaborator over others.⁵⁸¹ Advocates of inter-municipal cooperation look to neighboring communities, regionalists lean toward regional entities, subfederalists choose the state, while federal-local cooperation proponents orient toward agencies of the national government.⁵⁸² Evidence of multilevel, intergovernmental collaboration abounds, with localities working with partners up and down the vertical axis.⁵⁸³

Why scholars focus on, or even advocate for, particular collaborators, rather than embrace the flexibility evident in the wide variety of extant intergovernmental efforts to solve land use problems, is a bit of a mystery.⁵⁸⁴

577. See *supra* Part III (showing examples of local governance addressing local issues).

578. See *supra* Part IV; Marshall, *supra* note 34, at 93 (“The capacity at a given level to perform a task satisfactorily can often be enhanced through strategies seeking to strengthen access to the requisite capacities. Subsidiarity obliges actors at higher levels to explore such opportunities before ruling out the possibility of decentralizing tasks to lower levels.”).

579. See Marshall, *supra* note 34, at 80 (discussing the principle of subsidiarity as it applies to governance).

580. See *supra* Part IV (discussing levels of collaboration, including state and federal partnerships).

581. See *supra* Part IV.

582. See *supra* Part IV (discussing cooperation between municipalities, regional entities, and federal agencies).

583. Davidson, *supra* note 531, at 963–64 (emphasis in original) (“A pragmatic judicial approach to intergovernmental relations that does not give priority to any particular alignment of governmental collaboration allows the political branches at *all* levels of government to craft approaches most appropriate to modern exigencies.”); Kaswan, *supra* note 534.

584. See Ostrom, *supra* note 546, at 97 (advocating for a “[p]olycentric” framework for global collective action on climate change wherein responsibility for action is distributed across scales from local to global); see also Marshall, *supra* note 34, at 76 (“My purpose in this article is to explore what the ‘nesting principle’ means for contemporary efforts to pursue community-based environmental management beyond the local level.”)

This is especially true when one observes the changing policies of the courts and executive leadership at the state and federal levels from one decade to another.⁵⁸⁵ In some states, in some periods, state agencies might be extraordinarily helpful in providing needed assistance, while in other times federal players might stand closer to the bar.⁵⁸⁶ When serious water quality problems occur, local officials are required to respond, and they will search out and engage help where it exists in the moment.⁵⁸⁷

This is a long answer to the question that Margaret asked; she is the watershed leader we encountered in Part I.⁵⁸⁸ Margaret wanted to know why we were training land use leaders in her jurisdiction to initiate strategies to prevent public health problems by protecting water quality. Why, she wondered, is this not the responsibility of a state or federal agency?

We have included the principle of collaborative subsidiarity into our training method. We taught Margaret and her fellow leaders not just about local powers, but also about the partnerships they might form with neighboring communities; the powers and resources of the state departments of health, state, and environmental conservation; and the role of the EPA in protecting some sources of drinking water. The leaders in the program hailed from adjacent watershed communities and learned from one another how they might share resources through inter-municipal collaboration. We involved representatives of potential partner agencies in the training so that they could explain what they had to offer. We did not tell Margaret which collaborators to choose or how to organize a collaboration, but rather trusted her and the others in the room to craft their own partnerships based on the problem at hand, case studies from peer communities, and the resources available.

585. *See supra* Part II.A (discussing the CWA as it relates to both the Obama and Trump administrations, specifically the changing definition of WOTUS).

586. *See supra* Part IV (discussing various means of assisting local governments, including both state and federal solutions).

587. *See supra* Part IV (chronicling instances of local governments seeking collaboration).

588. *See supra* Part I.A (discussing the questions posed by Margaret, a local planning board chair, in which she questions why local governments use their municipal authority to prevent water pollution despite federal and state environmental laws).