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The Environment in New York State

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The Environment in New York State

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Abstract and Keywords

This article explores the environmental policy in New York State. Science is significant as a driver of environmental policy, but public opinion is even more important. The story of the New York State's water supply is dominated by the historic quest to supply water to New York City. The State Environmental Quality Review Act (SEQRA) has been the most fertile source of environmental litigation in New York State courts. New York's solid waste expenditures have soared as it has had to pay commercial landfills and incinerators to take waste that had previously been cheaply dumped at Fresh Kills. New York began the modern era as a vigorous and innovative leader in environmental protection measures, but since the early 1990s, the paralyzing partisanship in the legislature and inconsistent leadership in the governor's office have moved the state considerably further back in the national pack on many environmental issues.

Keywords: environmental policy, New York State, water supply, State Environmental Quality Review Act, environmental litigation, solid waste

□ □ □ the movement to protect New York State's abundant natural resources has played a central role in the social and economic development of the state, when the two come into conflict the desire to encourage economic growth has often taken precedence over preservation of the state's lakes, rivers, mountains, and forests. The state's resources were first placed in jeopardy when loggers, tanners, and then industrial manufacturers swarmed to New York, in pursuit of opportunities for natural resource extraction, inexpensive immigrant labor, and hydroelectric power. Although New York acted with foresight in implementing early legal measures to protect the environment, rapid population and industrial growth undercut those protections. As the state struggled to develop its infrastructure, growth came at a substantial cost to the environment.

Early on, discrete environmental concerns were considered independent problems that required specifically tailored solutions. Commissions, committees, and regulatory bodies with narrow charges proliferated, often in the wake of disasters, scientific advances, or legal battles that publicized the importance of environmental action in a particular area. For example, the first major environmental measures were taken in New York State only after health care providers revealed that poor sanitation was directly correlated to the epidemics that plagued the nation.¹ Very early on, Dr. Joseph Brown in 1798 recognized the link between disease and sanitation, and led the movement to establish the first sanitary reservoir within New York City limits. The warnings of medical professionals were reinforced by engineers, who argued that investment in infrastructure would yield monumental health (p. 793) benefits. These predictions led to the construction of comprehensive sewer systems and water supply storage and transmission systems across the state.

Scientific discovery also played a role in bringing about the regulation of harmful pesticides. Less than a decade after Rachel Carson's acclaimed *Silent Spring* revealed the damaging effects of pesticides like DDT, New York led the nation in promulgating pesticide regulations in 1970 and a ban on DDT in 1971. A year later, the national government followed, enacting the Federal Insecticide, Fungicide, and Rodenticide Act. The state continued to strengthen pesticide standards throughout the 1980s and 1990s as scientists found safer ways to control pests.

Advances in science have also laid the groundwork for air quality protection in New York. Though the scientific basis for acid deposition was first discovered in the nineteenth century, it was not until the 1960s that scientists began to study the effects of acid rain in the United States. After research revealed the deleterious effects of acid rain on health and the environment, the state implemented measures to curb emissions. In recent years, science has also revealed the harmful effects of greenhouse gas emissions on the global climate. New York, in the absence of effective federal and international controls, has responded in numerous ways, including participation in the Regional Greenhouse Gas Initiative.

Science is important as a driver of environmental policy, but public opinion is even more important. Initial efforts to preserve New York's wilderness areas began in the early nineteenth century as painters and writers spread the news of the sublime beauty of the vast expanse of untouched land in New York's North Country. Enthralled by portraits in words and paint, wealthy urbanites flocked to the Adirondack region to experience nature directly; the sportsmen among them purchased and preserved large tracts of land so they would be available for hunting rather than logging.

As art, literature, and direct experience increased the public's awareness about New York State's natural resources, three schools of thought emerged, each professing a distinct perspective about the role of the natural environment. Conservationists, led by the prominent forester and first chief of the U.S. Forest Service, Gifford Pinchot, emphasized the importance of scientific management of natural resources in order to produce economic benefits. Recreationalists, like Robert Moses in one of his many guises, focused on the need to preserve land for the enjoyment of the state's residents. Preservationists such as John Muir, cofounder of the Sierra Club, favored the protection of untouched wilderness for its own sake. Over the course of the twentieth century, all three of these philosophies would play a major role in increasing awareness about the need for environmental protection in New York State.

Citizen pressure built up, rising most rapidly during the late 1960s, and in the early 1970s, when the state's environmental administration was centralized in the Department of Environmental Conservation (DEC), New York State became a national leader in the movement to protect the environment. The efforts of New York's conservationists, recreationalists, and preservationists were buttressed by national legal advocacy organizations, many of which had their roots in New York, including Natural Resources Defense Council and Environmental Defense Fund. Together with (p. 794) older groups like the Sierra Club, the Audubon Society, and the Nature Conservancy, all of which took early action in New York, these organizations continue to protect the environment on national and international levels as well as in New York.

Initially local governments were responsible for matters now regarded as the subject of environmental policy. State government entered the environmental regulatory arena in response to the growth in size and scope of problems related to land use, and water and air pollution. While legal and regulatory action by New York State government persists in playing a vital role in environmental regulation, the federal government (in all three of its branches) and municipal governments remain major forces in the protection of the state's natural resources. The National Environmental Policy Act (NEPA), the Clean Water Act, the Clean Air Act, and numerous other federal statutes have provided key tools for protecting New York's environment. Furthermore, municipalities remain the central decision makers on land use matters in New York. The State Environmental Quality Review Act (SEQRA) requires municipalities to consider environmental impacts, mitigation, and alternatives prior to approving any action that may have a significant effect on the environment.² Under SEQRA, municipalities play a fundamental role in environmental and land use regulation.

Battles fought in New York courtrooms produced landmark outcomes for the environmental movement, both in the state and nationally. Three of a number of possible examples are illustrative:

- The U.S. Court of Appeals for the Second Circuit held in 1965 that the Federal Power Commission was required to consider the environmental consequences of Consolidated Edison's proposal for a pumped storage hydroelectric project on the Hudson River at Storm King Mountain, and that citizens could enforce this obligation in court.³ This judicial innovation, rooted in the text of the Federal Power Commission Act, stimulated the enactment of NEPA.
- After a protracted legal dispute, the Second Circuit found in 1985 that the U.S. Army Corps of Engineers violated NEPA by inadequately considering the detrimental effect on striped bass of Westway, a proposed interstate highway that was to be constructed in fill material along the Hudson River adjacent to Manhattan.⁴
- In a matter that reached the U.S. Supreme Court, it was decided in *C&A Carbone Company v. Clarkstown* that municipal solid waste “flow control” ordinances were unconstitutional restrictions of interstate commerce.⁵

Organization of State Government

A brief review of organizational history reveals the incremental development of New York State's attention to environmental matters, with attempts at consolidation (p. 795) offset by the creation of new agencies to address emerging concerns. Although protective environmental measures can be traced back to 1698, when the Earl of Belmont restricted the cutting of white pine in colonial New Amsterdam, the first significant strides toward environmental protection began when the Fisheries Commission, the state's first environmental agency, was created in 1868 to study the impact of logging on fish and water supplies. Efforts to preserve the environment were bolstered in 1872 when the Commission on State Parks convened to develop a plan for the conservation of the state's forested lands. The New York State Forest Preserve was established in 1892; just two years later, protection of large portions of the state's vast forested lands was given constitutional force, with the addition of the Forever Wild clause in the state constitution at the 1894 convention. In 1895 the Fisheries Commission merged with the Forest Commission to form the Forest, Fish, and Game Commission. The Forest Preserve Board was established in 1897 to manage the Catskills and Adirondack Forest Preserve and to facilitate the acquisition of new land for the state. In 1901 the Department of Health

replaced the State Board of Health, originally created in 1880, and was charged with protecting the state's drinking water resources.

In 1911 each of the formerly independent land and water management commissions were combined in a single Conservation Commission, under which fell the Divisions of Lands and Forests, Fish and Game, and Inland Waters. Despite the centralization effort, by 1920, twenty-three commissions remained; the state attempted further reorganization, as part of an overall restructuring, when it replaced the Conservation Commission with the Conservation Department in 1927.⁶ Over the following four decades, numerous semiautonomous bodies were created to oversee the management of the state's environmental resources.

The watershed year of the modern environmental movement was 1970. On New Year's Day, President Nixon signed NEPA, and a few months later he created the U.S. Environmental Protection Agency (EPA) and Congress enacted the Clean Air Act. That year, the long-sought centralization of environmental policy administration in New York was realized with the creation of the Department of Environmental Conservation (DEC) by Governor Nelson Rockefeller. In addition to absorbing the functions of the Conservation Department (with the exception of the Division of Parks), the DEC assumed the duties of the Water Resources Commission and the Air Pollution Control Board, took over responsibility for water pollution control and solid waste management from the Department of Health, and absorbed the pesticide control functions of the Department of Agriculture and Markets. The integration of the various long-established professional perspectives included in the new agency into a shared vision and mission proved challenging, and even with the passage of time, integration has not been fully realized.⁷

Throughout the 1970s and the 1980s the New York State and federal governments enacted a series of important environmental statutes, and New York was often in the forefront. However, momentum at both levels, and bipartisan consensus, largely abated in the 1990s. Congress has not enacted a major environmental statute since 1990, the year that the first President Bush signed both (p. 796) the Oil Pollution Act and the Clean Air Act Amendments. New York's most important environmental statute of the past two decades, which established the Brownfields Cleanup Program of 2003, came after most other states had already enacted similar laws. The locus of statutory innovation in the environmental field shifted to California and to Europe, and remains in those places today.

The environmental movement in New York remains vigorous at this writing, but it is perpetually frustrated over the failure of the legislature to enact significant new environmental laws. Over many years a pattern emerged under which the assembly, led by the Democrats, would pass numerous environmental bills, only to see them die in the

Republican-led senate. The Democratic majority briefly achieved in the senate in 2009 was too narrow and fragile to result in the passage of important new laws (e.g., bills on climate change, citizen suits, and standing under SEQRA passed in the assembly but died in the senate).

Water Supply

With more than 7,600 freshwater lakes, 17,000 miles of rivers, and 8,452 independent groundwater systems, New York State enjoys a remarkable endowment of water resources.⁸ The Great Lakes, two of which, Lakes Erie and Ontario, are partly in New York, are the world's largest freshwater source; they hold 95 percent of the freshwater in the United States.⁹ The Finger Lake Basin and Lake Champlain also provide substantial water supplies for New York residents. But all this water is not where most of the state's people live. The story of the New York State's water supply is dominated by the historic quest to supply water to New York City.

New York City

Settlers in the colony of New Amsterdam on the southern tip of Manhattan were impressed with the plentiful water resources of New Amsterdam and reported that “waterfalls, streams and brooks ... provided good drinking water and were all very clear and pure.”¹⁰ After the first public well opened to accommodate the growing population in 1677, the city directed the residents lining each street to excavate and maintain community wells. Early New Yorkers also drew drinking water from Collect Pond, a 48-acre freshwater lake situated near present-day Foley Square. By the 1740s Tea Water Spring (located just northeast of Foley Square) was rumored to dispense the cleanest water in the city, and vendors earned the name “teawater men” as they traversed the city's streets carrying casks of spring water for sale at one cent per gallon.¹¹ Although innovative designs for an engineered city reservoir (p. 797) first emerged in 1776, the Revolutionary War frustrated immediate development. More than 20 years later, the city finally contracted with the Manhattan Company to construct a 500,000-gallon reservoir, complete with an integrated network of wooden mains, that would initially supply more than 400 families with drinking water.¹²

The new reservoir alleviated pressure, however most New Yorkers remained dependent on private wells, Collect Pond, and Tea Water Spring. The city's population soared between 1790 and 1830, which led to the degradation of the city's water resources. With Collect Pond and Tea Water Springs in disrepair, and only one major reservoir and 250

wells serving nearly 100,000 New Yorkers, the city's residents feared deadly water shortages.¹³

Without a comprehensive waste management or sewage system, the filth and refuse that accumulated in the city's thoroughfares ran freely into drinking water sources. In 1798 the fouled water supply led to a yellow fever epidemic that resulted in 2,000 deaths. More than 30 years later, the Asiatic cholera epidemic of 1832 took more than 3,400 lives. In addition, small and midsize city fires brought the realization that additional sources were needed for the protection of life and property. The first reservoir for firefighting purposes was built at Broadway and 13th Street after an 1828 fire raged across the city and destroyed \$600,000 worth of property.¹⁴

New York City's Common Council established a permanent Water Commission to propose and consider options for water supply development. The Water Commission recommended the construction of the Croton Reservoir and a 42-mile aqueduct that would connect the reservoir, located in Westchester County, to the city via four receiving and distributing reservoirs within the city limits. Following public approval in 1834, and a period of temporary local opposition to property acquisition, the Croton system was finally completed in 1848.¹⁵

As population and water demands grew after the Civil War and throughout the late 1800s, New York City continued to build new aqueducts and reservoirs. In 1884 an Aqueduct Commission was appointed to consider constructing a deep subsurface aqueduct that would triple the carrying capacity of the 42-year-old Croton Aqueduct and tie together the haphazard network of existing reservoirs. In 1891 the New Croton Aqueduct, then the largest water conduit in the world, began carrying water from the Old Croton Reservoir to the city.¹⁶ By 1905 the 1.9-billion-gallon New Croton Reservoir was completed and the available daily water supply of the Croton system soon exceeded 400 million gallons.¹⁷

After the creation in 1898 of Greater New York, a regional government incorporating three cities and numerous towns into (then) four counties, continuing shortages made it painfully clear that the consolidated city lacked an adequate water supply. Attention turned further north, to the untouched creeks and rivers nestled in the foothills of the Catskill Mountains. Over vehement local opposition, the Ashokan Dam and the Catskill Aqueduct were built to deliver 550 million gallons each day to the existing New York City system through connections in Westchester and Putnam Counties. Construction of additional dams and conduits (p. 798) proceeded in the Catskills for the next four decades. Attention then turned to the Delaware River watershed, where, after a dispute with New Jersey, the city completed four more reservoirs between 1950 and 1964.¹⁸

By the late 1980s nonpoint source pollution—from farms, septic fields, construction runoff, and other sources—posed a serious threat to the hard-won network of reservoirs.¹⁹ In 1989 the EPA responded to growing national concerns about water supply contamination by promulgating the Federal Surface Water Treatment Rule, which imposed stringent filtration standards on state and city water systems. Faced with an enormous fiscal burden of developing a \$9 billion plant to filter the 1.2 billion gallons of water that it used each day, the city sought to make use of the rule's exemption that permitted comprehensive watershed protection and stringent water quality standards in lieu of filtration.

Initially the state promulgated a mandatory regulatory regime that would bring the Catskill and Delaware watershed into compliance with EPA's rigorous requirements. The regulations imposed severe restrictions on the local economy; many Catskill, Delaware, and Hudson River Valley residents were outraged that, once again, substantial benefits had been conferred to New York City at their expense. Eventually the collective local voice was heard and, after a key 1993 shift in New York City's leadership, Mayor Rudolph Giuliani encouraged the development of a voluntary system for ensuring watershed security. After several years of negotiation, a memorandum of agreement committed New York City to funneling more than \$1.4 billion into the Catskill region for land acquisition and water pollution controls.²⁰ Controversy continues, however, as many residents of the watershed area resent the restrictions on the development of their communities, and the City of New York remains eager to avoid the expense of building a filtration plant.

New York City's water system was regional in design, begun at a time when much of the land in the city was still undeveloped. Over the century since it was started, suburban development has extended far beyond the city's boundaries, with cities, towns, and villages in counties bordering the city facing their own water supply problems. As for itself, New York City continues to demand an extraordinary amount of water to supply its growing population. Today, these needs are satisfied by 19 reservoirs and three controlled lakes, with an approximate capacity of 580 billion gallons.²¹ Delivered primarily by gravity, only 5 percent of the water is regularly pumped, although droughts have required substantial fluctuation in pumping practices. Even with more than a century of vigorous water resource development, New York City continues to search for new ways to ensure water security for its citizens. The newest piece of New York City's intricate water supply scheme is a third major delivery tunnel connecting the city to its network of northern reservoirs and providing protection against failure of the existing old tunnels. With costs soaring to an unprecedented \$6 billion, Tunnel No. 3 is the largest capital construction project in New York City's history, one of the most sophisticated engineering feats in the world, and is not expected to be completed until 2020.²²

(p. 799) **Hudson River Valley**

Lying between the Catskill and Delaware watersheds to the west and the Croton watershed to the east, the Hudson River Valley's rich water resources have been the focal point of the contentious struggle for valuable water resources for almost a century. As discussed earlier, Hudson River Valley residents have been forced to conform their activities to state and federal standards in order to ensure the protection of New York City's water supply (as well as their own). However, in recent years Hudson River Valley communities have recognized their unique water resources and have taken remarkable measures to ensure the protection of those resources for years to come.

Most Hudson River Valley communities receive between 38 and 44 inches of precipitation per year, whereas many western states only receive 15 inches.²³ The Hudson River also brings water down from a 12,000 square mile watershed to the north. Unlike the Great Lakes region and midwestern aquifers, which frequently experience droughts and water shortages due to overpumping, the Hudson River Valley is one of the few areas of the United States where precipitation increases are anticipated in the future.²⁴ The region has developed sustainable water use principles to maintain the area's current status, initiated programs to reduce point source pollution, mandated storm water management techniques, implemented aquifer pumping test protocols, encouraged watershed organizations, and created the Hudson River Estuary Program. Today, Hudson River Valley counties continue to work to reduce sources of nonpoint source pollution, replace aging infrastructure, and require well testing, among other preservation mechanisms, in order to safeguard the region's unique water resources.

Northern and Western New York

New York City was not the only city establishing and expanding its water resources in the nineteenth and twentieth centuries. Many New York cities have followed New York City's lead in aggressively acquiring drinking water supplies for their residents by switching from a system of private and public wells to engineered reservoirs.

In the mid-nineteenth century, families living in Rochester accessed drinking water at communal wells. The well water quality was so poor that the Board of Health Report of 1875 stated that "we have few wells in our city that are fit for use, and in the densely populated portion they are almost without exception, absolutely unfit."²⁵ Finally, in 1872, after 30 years of foiled plans for private development of an engineered reservoir, the city passed an act that authorized the construction of a municipally owned and operated reservoir and aqueduct. Completed in 1876, the 120 million gallon two-basin system,

including Hemlock Lake and Mt. Hope Reservoir, was greeted with widespread support by the city's 70,000 residents. Although intermittent bouts of contamination required the city to acquire (p. 800) shorefront property over the course of the twentieth century, the city's first reservoir has successfully supplied drinking water to Rochester's residents for more than 140 years.²⁶ Today, the City of Rochester's water supply is primarily drawn from Hemlock Lake and the Finger Lakes, located approximately 28 miles south of the city.

The story of Albany's municipal water supply is similar to that of New York City. Initially a private company, the Albany Waterworks Company tapped Maezlandt Kill, Middle Creek, and Patroon Creek to supply the city's residents with drinking water. However, Albany's age of engineered reservoirs began in 1851 with the construction of Six Mile Water Works. The city broke ground six miles west of Albany City Hall, hence the name, and constructed a dam across Patron Creek, which created a 48-acre impoundment. Six Mile, now called Rensselaer Lake, was decommissioned as a primary water supply in the 1920s and has now been transformed into a recreational haven for the residents of Albany, complete with boating, hiking, and fishing.

Great Lakes

The Great Lakes form the world's largest source of freshwater and contain 95 percent of the freshwater in the United States. Three million New Yorkers rely on Lake Ontario or Lake Erie for potable water.²⁷ Unfortunately the Great Lakes have been compromised by shoreline development, waste disposal, water supply extraction, and pollution from mining, cargo ships, and commuter ferries. Perhaps most notably, the Great Lakes region is home to 60 percent of the world's automobile and steel manufacturers. The resulting pollution has had a detrimental effect on the water quality of the entire region.²⁸

New York State, the federal government, and the international community have recognized the Great Lakes region's importance since 1905, when the International Waterways Commission was established as an investigatory and advisory body for the U.S. and Canadian governments.²⁹ By 1909 Canada and the United States acted on the Commission's recommendations and signed the 1909 Boundary Waters Treaty to create the International Joint Commission on the Great Lakes. Protections were increased with the Great Lakes Water Quality Agreement of 1972, and its 1978 amendments. Focused on nutrient loading and the control of toxic substances, the binding compacts made strides against the environmental degradation of the Great Lakes.

In 1983, amidst looming threats of water diversion to the American southwest, nine governors in the Great Lakes region, including New York's Governor Mario Cuomo,

organized to form the Council of Great Lakes Governors. The council, generally in cooperation with Canadian federal and provincial governments, has undertaken numerous activities to, for example, regulate the use of waters, reduce pollution into them, battle aquatic invasive species, and foster regional economic development.

(p. 801) **Water Pollution**

No different than other colonial settlements, New Amsterdam did not provide public services. One result was that household waste, typically disposed of in the streets, often found its way into the Hudson and East Rivers. As the population expanded in the eighteenth century, New Yorkers began to rely on private privies and cisterns. However maintenance was unpleasant, and accumulation and overflow was chronic. By the late eighteenth century, New York City's Common Council devised a system under which residents of each street might submit a collective application for the construction of an open sewer, with special assessment costs imposed on those who desired the improvement. Some wealthy individuals and private companies embarked on the construction of underground conduits that eventually crisscrossed the city, but most New Yorkers could not afford the hefty subscription costs.

By the nineteenth century, many cities had established public works departments to cart garbage and clean streets, but they proved to be little better than prior individual efforts, often dumping the bulk of waste directly into waterways. To make matters worse, the industrial presence in New York flourished and tanneries, pulp mills, and industrial manufacturers released large quantities of chemical byproducts into the waters.³¹ Physicians and engineers lobbied for a comprehensive water-carriage system that would integrate waste management infrastructure with existing storm water sewers and allow waste to be flushed away by water.

The long-awaited completion of the Croton Aqueduct, which introduced significant water supplies to the city in 1842, made water-carriage waste disposal a possibility. Political clashes ensued between the Common Council, which retained its historic role of sewage site approval, and the Croton Aqueduct Department, which was formed in 1849 to oversee public works management for water supply and waste removal. With the help of the state, the Croton Aqueduct Department won the battle, and by the end of the 1860 the city had installed 271,000 liner feet of underground sewers.

However, New York City's efforts to integrate the haphazard storm water system with the new sewage system brought complications. Problems arose when antiquated storm water sewers were used to connect household drains to new waste carriage sewers, without

regard for pipe placement, capacity, gradation, or pressure. The city's attempts at systematic integration resulted in a poorly coordinated system that failed to implement basic principles of sanitation engineering.

The responsibility for drinking water quality was transferred from cities to the State Department of Health in 1885, but dumping and poor sewage infrastructure continued to haunt the state throughout the twentieth century.³² By the 1920s, New York City's combined sewage system had proven disastrous. It did not implement any treatment mechanisms and “virtually all of the city's raw sewage was dumped directly into New Yorks’ rivers and bays.”³³ Several studies revealed the shockingly poor water quality of the New York City harbor. In 1935 New York City established (p. 802) the state's first sewage treatment plant on Coney Island. While some municipalities across the state followed New York City's example and began to develop a treatment infrastructure, progress was tentative. Technology was developing and construction costs were typically borne solely by the municipalities. During periods of heavy rain, older cities like New York City and Albany, which had combined storm water and sewer systems, continued to release untreated combined sewage overflow into water bodies.³⁴

A 1934 Supreme Court decision ordering New York to stop all ocean dumping led to increased concern about water pollution in the tristate region. In 1935 New York joined with New Jersey and Connecticut to form the Interstate Sanitation Commission. The mission of the commission was to perform studies and promulgate regulations to control future pollution and abate existing pollution in New York Harbor and adjacent waters.³⁵ Despite the measures taken by the commission throughout the 1930s, New York continued to face water pollution problems and, by the 1940s, it was clear that regulatory action would be necessary.

Federal Action

By the 1940s New York was far from alone in fouling its waters. Congress took notice and, in 1948, passed the first version of the Federal Water Pollution Control Act (FWPCA). Although it did not establish a mandatory regulatory scheme, it did provide federal grants for the implementation of state programs to eliminate pollution and improve sanitary systems. The practical force of the FWPCA's initial goals was strengthened with the FWPCA Amendments of 1956, which established a major federal grant system to improve sewage treatment across the United States.

New York seized the opportunity to use federal funds to improve its aging sewage infrastructure; urged on by Governor Nelson Rockefeller, voters approved the Pure Waters Bond Act of 1965, which provided \$300 million in matching funds to generate a

massive influx of federal money under the FWPCA for sewage treatment. Municipalities, which were struggling to update water treatment infrastructure for their growing populations, were now only responsible for 40 percent of the costs.³⁶ In 1972 Congress amended the FWPCA, articulating a broad national objective to restore “the chemical, physical and biological integrity of the nation's waters.”³⁷ The federal grant program, was accompanied by regulatory mechanisms to control effluents and ensure high water quality standards, including a program requiring point sources of water pollution to obtain permits. The 1972 amendments also required all sewage treatment plants to upgrade to secondary treatment, which would remove 85 percent of sewage pollution. Although the original deadlines were extended for many metropolitan areas, including New York City, the 1972 FWPCA amendments proved to be a turning point in the nation's water pollution control efforts.

(p. 803) New York voters further supplemented the federal program with the Environmental Quality Bond Act of 1972, which provided \$650 million for construction and maintenance of sewage treatment facilities.³⁸ Just one year later the legislature created a water pollution permit program, now a central part of the state's land use approval system, which went beyond the federal requirements.

Wetlands

Historically wetlands were considered unhealthy, insect-breeding swamps that were not naturally tailored for productive use. Disdain for swamps led to a policy of aggressive destruction to make way for agriculture and development. Drain-and-fill operations were understood as a sign of progress and were often subsidized by the state and federal governments. In time, however, science revealed that these features—now relabeled wetlands—provide vital ecosystem services, including flood control, erosion prevention, pollution treatment, and species habitat. But by 1980, approximately 60 percent of New York State's wetlands had been annihilated.³⁹

Federal action began with the enactment in 1972 of section 404 of the Clean Water Act (as the FWPCA came to be known), which required those seeking to fill wetlands to obtain a permit from the U.S. Army Corps of Engineers. Around the same time New York created the Wetlands Task Force to define the contours of the state's wetland policy. Governor Rockefeller vetoed the 1972 Tidal Wetlands Act, based on the task force's recommendations, citing unease about the elevation of environmental concerns over economic realities. A year later, legislation to protect tidal wetlands was reintroduced and eventually passed, though with several important concessions. New York's Tidal Wetlands Act of 1973 required the DEC to maintain an inventory of tidal wetlands, mandated developers to obtain rigorous permits, and placed a temporary moratorium on

wetland alteration. Two years later New York State passed the Freshwater Wetlands Act of 1975, which provided protection for freshwater wetlands larger than 12.4 acres.⁴⁰ Subsequent efforts to lower this threshold have not succeeded. However, the freshwater and tidal wetlands programs have given DEC significant power over land development in the state, since so much otherwise developable land falls within wetlands or their regulated buffers.

Parklands

New York first recognized the need to manage its vast land resources in 1779, when it created the New York State Land Commission to coordinate the sale of the state's excess property. Almost half a century later, in 1836, the state legislature (p. 804) commissioned the New York Natural History Survey to provide a fundamental understanding of the scope of the state's natural resources. Ebenezer Emmons, a preeminent geological scientist, was assigned responsibility for the study of the wilderness area that he would later coin "the Adirondacks."⁴¹ The publication of his *Natural History Survey Report* fueled New Yorkers' intrigue with the untouched land in New York's forested regions.

The public's interest in open space was affirmed when New York City set aside 840 acres to make way for what became Central Park, designed by Frederick Law Olmsted and Calvert Vaux.⁴² When Central Park opened in 1859 it became a revered cultural symbol and marked an important victory for the burgeoning national idea that open space was necessary to support the health and well-being of residents.

As urban New Yorkers enjoyed Olmsted's historic metropolitan haven, the logging industry quietly exploited much of the forested land in the north of the state. Although logging initially began as a locally owned industry, by 1860 a large-scale commercial logging industry had destroyed expanses of forest across much of the Adirondack region. New York State led the nation in the production of lumber in 1850, but by the turn of the century, unsustainable clear cutting, widespread forest fires, and poor resource management caused the state to drop to seventeenth place.⁴³

Opposition to the logging industry only gained widespread popular strength when the threat of forest fires and runoff promised to interfere with commercial interests. After valuable white pine and spruce trees were removed, flammable concentrations of unwanted debris, brush, and bark were left to cover the forest floor. Raging forest fires, commonly ignited by engine sparks from passing trains, resulted in the complete destruction of the remaining vegetation. Without forest cover, runoff swept the barren land, causing fluctuating flood and drought conditions on the state's vital waterways.

New York City merchants, who relied on the Hudson River, the Mohawk River, and the Erie Canal to maintain a competitive advantage over Midwest merchants, grew alarmed by the looming threat to commerce. This concern resulted in an improbable partnership between the state Chamber of Commerce and preservationists to pressure the state government to take measures to protect forestland.

The state government first responded to the logging crisis in 1868 when it established the Fisheries Commission to study the impact of logging on fish and water supplies.⁴⁴ This commission failed to recommend any decisive action. Concern was aggravated in 1872 when Verplank Colvin, a lifelong advocate of conservation, published an account of his ascent of Mt. Seward, in which he warned that the “steadily diminishing flow of water in principal canals and rivers ... threatened commerce.”⁴⁵ Like Ebenezer Emmons's *Natural History Survey*, Colvin's descriptive prose helped make conservation a priority for the people of New York.

In 1872 the legislature recommitted the state to addressing the perils of deforestation by creating the Commission of State Parks to investigate whether the state should acquire land in the northern timbered region for conversion into a public park. The commission recommended that the state establish “a park that would be (p. 805) managed not as a wilderness but as a working forest, with controlled logging and replanting.”⁴⁶ Again, no action was taken.⁴⁷

Niagara Falls Reservation

French missionaries in the 1670s were the first Europeans to note the astounding beauty of Niagara Falls, but the movement to preserve the western treasure did not take root until nearly 150 years later, when the literary and artistic community condemned the onslaught of developers who flocked to the region to take advantage of the breathtaking views and hydraulic resources. Eventually the urgent message of artists and writers was heard by environmental activists, including Frederick Law Olmsted, the father of Central Park.

Olmsted, who spent many childhood summers in the Niagara area, rallied support, and eventually turned to Canada's Lord Dufferin for assistance. Dufferin proposed the first international park to New York's governor, Lucius Robinson, in September 1878.⁴⁸ With the support of Governor Robinson, the state legislature instructed the Commissioners of the State Survey to determine what measures would be necessary to successfully preserve Niagara Falls. The commissioner's special report, though hesitant about Dufferin's proposed international park, recommended that the state acquire the land necessary to protect the scenery of the falls.

Governor Robinson's successor, Governor Alonzo T. Cornell, was not supportive of the proposed Niagara Reserve. While awaiting a new opportunity for legislation, supporters formed the Niagara Falls Association to advance their goal. The fate of Niagara Falls was finally secured on April 30, 1883, when newly elected governor Grover Cleveland, formerly mayor of Buffalo, close to the falls in western New York, signed a bill authorizing the appropriation of lands in Niagara Falls for a state reservation. In 1885 the Niagara Falls State Reservation was formally dedicated and opened to the public.⁴⁹

New York Forest Preserve and Adirondack Park

As with the Niagara Region, the movement to preserve the Adirondacks was initially fueled by the literature and art that memorialized the breathtaking landscape. This romantic tradition began with European intellectuals like Rene de Chateaubriand, who wrote the absence of roads, towns, laws and kings filled him with a "sort of delirium."⁵⁰ Again, in 1836, the American editor Charles Fenno Hoffman moved his readers when he published the first travel article about the Adirondacks entitled "Wild Scenes Near Home: or Hints for a Summer Tourist."⁵¹ In a series of novels published from 1823 to 1841, James Fenimore Cooper penned a magical description of the wilderness of New York State and the men who lived (p. 806) there. Similarly, Ralph Waldo Emerson's poem, "The Adirondacs," recounted his trip to a wealthy intellectual resort tucked away in the Adirondack Mountains and inspired thousands. The explosion of natural literature was accompanied by the landscapes of Thomas Cole and others of the Hudson River School who preserved the unrivaled beauty of the river valley on canvas.

The Adirondacks soon became a popular resort destination for the urban elite. The most privileged families built luxurious private lodges and castles, and many others took advantage of hotels and resorts that opened for operation in the 1860s.⁵² After a stay in the Adirondacks as part of his own treatment for consumption, Dr. Edward L. Trudeau was so impressed by the health benefits of the mountain air that he opened a tuberculosis sanitarium on Saranac Lake in 1884.⁵³ Within months Trudeau's "wilderness cure" had become world renowned, and many other sanitariums opened as patients flocked to the Adirondacks in hope of a cure.

In 1884 the legislature established a Forest Commission to investigate and report on the prospect of developing a statewide system for forest preservation. The next year, Governor David B. Hill signed the New York State Forest Preserve into law to ensure that "within the Forest Preserve counties all the lands owned by the state, or lands which might subsequently be acquired were to be ... kept forever as wild forest lands ... and no part of it was to be sold, leased nor taken by any person or corporation, public or

private.”⁵⁴ The objective was not only to protect public land, but to gradually acquire private land through bonds and tax defaults in order to ensure its preservation.

It soon became clear that the state could not acquire the amount of private land requisite to achieve an uninterrupted block of forested land. Therefore the legislature enacted the Adirondack Park Enabling Act of 1892, which instructed the Forest Commission to draw a “blue line” that carved out the borders of an Adirondack Park from the initial Adirondack Forest Preserve. Within these smaller, more manageable boundaries, the state focused its land acquisition efforts. While the 551,000 acres of publicly owned land within the blue line was to be “forever reserved for the use of all people,” the fate of more than 2.3 million acres of privately owned land in the preserve continued to be a contested issue over the course of the twentieth century.

In the immediate aftermath of its passage, advocates of the State Forest Preserve and Adirondack Park were alarmed by the legislature's loose interpretation of the 1892 act. Their concern culminated with the meeting of a state constitutional convention. In 1894 voters reaffirmed their desire to protect the State Forest Preserve, and Adirondack Park, when they ratified a new state constitution that included the famous Forever Wild clause:

The lands of the State, now owned or hereafter acquired, constituting the Forest Preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold, or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed.⁵⁵

Despite the monumental significance of the Forever Wild clause, it became vulnerable to attack as industry and property owners challenged the extent of its (p. 807) protection. Interests that initially combined forces to protect the forestland discovered that each group held divergent ideas about how the land should be managed. Pure preservationists faced an uphill battle against conservationists, recreationalists, and those from industry, most of whom believed that some cutting should be allowed to provide road access, hiking trails, accommodations, reservoir construction and scientific forest management experiments.⁵⁶ In 1899 the *New York Times* uncovered that “widespread logging continued in the Preserve, in clear violation of the law.”⁵⁷ Landowners joined with prominent lawyers, including lawyer and preservationist Louis Marshall, who was a delegate to the 1894 constitutional convention, to found the Association for the Protection of the Adirondacks in 1901. For the next 30 years this association litigated to define the meaning of the Forever Wild clause in its most protective sense.

New York Forest Preserve and Catskills State Park

The state Forest Commission originally dismissed the possibility of including the Catskills region within the Forest Preserve.⁵⁸ Nonetheless, the State Forest Preserve Law

eventually placed 650,000 acres of public and private land in the Catskill region under protection.⁵⁹ Ulster County inadvertently initiated the first effective move to preserve the Catskills when, burdened with a debt of \$40,000 in back taxes on abandoned property, it structured a midnight deal to pass lands to the state for inclusion in the upcoming Forest Preserve legislation.⁶⁰ The Catskill Park gained “blue line boundary” protection similar to that given the Adirondacks by state action in 1904.

Today, the management of much of New York's public land is vested in DEC's Division of Lands and Forests. The division is charged with managing and protecting the state forest preserve and other protected lands; administering the Wild, Scenic, and Recreational Rivers system; promoting the expansion of the state's forestry industry; preventing and fighting forest fires; acquiring land for protection and public use; urban forestry; and public education.⁶¹ The division, along with the Adirondack Park Agency (discussed later), manages more than 3.7 million acres of land, including 2.6 million acres in the Adirondack Forest Preserve, 280,000 acres in the Catskill Forest Preserve, and 750,000 acres of protected land across the state.⁶²

State Park System: Public Land Preservation in the Twentieth Century

Governor Smith took a decisive step toward an organizational overhaul of New York's parks in 1922 when he appointed Robert Moses as the head of his newly created Reconstruction Commission. Moses, the man who would soon come to (p. 808) be known as the father of New York parks, proposed a State Council of Parks and secured a \$15 million bond issue for parkland acquisition and operations. By 1924 the legislature formally adopted Moses' proposal, and created the first unified state park system in the nation.

Under Moses' design, most budgetary discretion was vested in eight regional park commissions. The State Council of Parks, with Moses at its head, provided oversight, integration and direction.⁶³ An avid advocate of recreation, Moses believed that the beauty of New York's natural resources should be available for all New Yorkers, and he worked diligently to establish parks and recreation spaces, and parkways and bridges to increase access.⁶⁴ Moses resisted centralized organization of the state parks, first in 1922–1924, when Governor Smith mandated centralization, and again in 1927, when the Division of Parks was created, and finally in 1959, when Governor Nelson Rockefeller attempted reorganization.⁶⁵ Laurance Rockefeller, Governor Rockefeller's brother, finally succeeded Moses in 1966 as chairman of the State Council of Parks;⁶⁶ the change in

leadership enabled the governor to create an Office of Parks, Recreation, and Historic Preservation within the Executive Department.⁶⁷

Adirondack Park in the Twentieth Century

As more roads were built in the 1950s and 1960s, automobile tourists flooded Adirondack Park, and environmentalists became increasingly concerned about the effect of tourism on the environment. In response, Governor Rockefeller established the Temporary Study Commission on the Future of the Adirondacks in 1968, to “identify the problems of the Adirondacks in broad, long range terms.”⁶⁸ The Temporary Study Commission's report recommended the creation of a permanent and independent Adirondack Park Agency (APA) that would have the power to “regulate use and development of all land, public and private, in the six million acre Adirondack Park, and ... override the zoning decisions of local communities and the land use plans of private property holders.”⁶⁹ In May 1972, Governor Rockefeller signed a bill that created the APA, expanded the park to its current size of 5,927,600 acres, and initiated the nation's first system of comprehensive land use control for such an expansive area.⁷⁰

The APA first established a state land master plan, a management system for the publicly owned lands in the Forest Preserve and Adirondack Park.⁷¹ Later, in March 1973, the agency released a private land use and development plan (PLUDP),⁷² which implemented a system of regional intensity zoning and made subdivision difficult by requiring state permits in addition to local approval.⁷³ The impact of the PLUDP was significant because more than 3.7 million acres in the Adirondack Park, three-fifths of its total area, remained under private ownership. Incensed landowners, who fiercely resisted this initiative in pursuance of their right to develop their properties, allied with industry to form the League of Adirondack Citizens Rights. The league galvanized a considerable membership, (p. 809) organized protest groups, held meetings across the state, and published opinion pieces in newsletters, newspapers, magazines, and books.⁷⁴ The APAs involvement of local residents through the creation of a local government review board did little to ease tensions between preservationists and property rights advocates.

The Association for the Protection of the Adirondacks, originally founded at the turn of the century to sharpen the teeth of the Forever Wild clause, reemerged in the 1980s and proved to be an invaluable ally for the APA. It combined with other prominent environmental groups to found the Adirondack Council, which successfully litigated in support of the APA's legal authority to restrict property rights in accordance with statutory and constitutional provisions.

By the end of the 1980s it became clear that the APA, which took planning measures to restrict development less than two decades earlier, would not stand alongside the Adirondack Council in opposing increased development in Adirondack Park. In 1987 alone, the agency's permit applications rose by nearly 60 percent; land developers began to erode the hard fought successes won by the Adirondack Council in the early 1980s.⁷⁵ Environmentalists were infuriated, and warned that the Adirondacks region was “entering ... an era of unbridled land speculation and unwarranted development that may threaten the unique open space and wilderness character of the region.”⁷⁶ A Commission on the Adirondacks in the 21st Century, created by Governor Mario M. Cuomo in 1989 and chaired by Peter A. A. Berle, recommended a moratorium on development in select areas and extensive public land purchases, and published a comprehensive map, but no action was taken.⁷⁷

Catskills Park in the Twentieth Century

Environmentalists and locals feared that the close proximity to New York City, the dense population, and the lasting effects of deforestation would make “the depredation of forest preserve lands resulting from incompatible uses ... a more serious problem in the Catskills” than in the Adirondacks.⁷⁸ The problem was aggravated by the absence of regional planning and local land use controls. As of December 1974, only 71 of the 160 towns, villages, and cities in the Catskills had zoning ordinances or planning boards with subdivision regulations, and those that did permitted large population increases without much regard for the protection of natural resources.⁷⁹ Formed in 1969, the Catskill Center for Conservation and Development, the Catskills counterpart of the Association for the Protection of the Adirondacks and the Adirondack Council, demanded local and statewide regulatory protection to defend the Catskills Forest Preserve and Park against private exploitation.

In 1971 the legislature established the Temporary State Commission to Study the Catskills to seek ways to protect the region from unplanned growth and to propose measures to assist local governments in ensuring that the development of private lands would be consistent with the preservation goals of the Forest Preserve and Catskill Park. The commission recommended a regional comprehensive plan (p. 810) for the regulation of private and public land use and an economic development program for the Catskills region. While many of the commission's recommendations were adopted, including a master plan for the management of state land, the regulations implemented in the Catskills were much less extensive than those promulgated to protect the Adirondacks.

Long Island Pine Barrens Preserve

Located in Suffolk County, the Pine Barrens covers more than 100,000 acres and is the largest remaining remnant of a forest that once blanketed 250,000 acres.⁸⁰ It is the home to thousands of plant and animal species and the site of vast underground aquifers that supply the drinking water for most of Long Island. In the 1970s the state recognized the aesthetic and functional value of the Pine Barrens and initiated the creation of a greenbelt through aggressive public land acquisition.

The barrens was threatened in 1978 when a free trade zone to stimulate development was proposed. The Long Island Pine Barrens Society (LIPBS), founded a year earlier by three environmental science students, worked to oppose the free trade zone and other development plans by investing in scientific research, public education, and advocacy. Opposition to development gained momentum in 1984 when the legislature created the Pine Barrens Review Commission. Two years later, voters affirmed their commitment to the preservation of the Pine Barrens when they approved a small sales tax increase to fund 28 new park sites and the protection of 4,000 additional acres under a Suffolk County open space program.

Nonetheless, development pressures led to increased private land acquisition and demands for expedited approval of subdivisions and other construction in the Pine Barrens.⁸¹ In 1989 LIPBS filed a lawsuit against the Suffolk County Department of Health and municipal zoning boards to require the preparation of a comprehensive environmental impact statement prior to development approval.⁸² The LIPBS persisted in its litigation campaign against development projects. After extensive negotiations among developers, environmentalists, and government officials, the legislature adopted the Long Island Pine Barrens Protection Act, which mandated the production and implementation of the Central Pine Barrens Comprehensive Land Use Plan.⁸³

Land Use and SEQRA

Land use regulation has long been a local function in New York. New York's "home rule system" is thought to facilitate direct political accountability and encourage community involvement in local matters. Some find its roots in the state constitution, affirming "effective local self government" as one of the "purposes of the (p. 811) people of the state."⁸⁴ While state and regional governing bodies have consistently vied for power over land use decision making, as the Adirondack and Catskills cases clearly show, attempts to

shift land use oversight remain highly controversial, and the bulk of regulatory authority remains in the hands of New York cities, towns, and villages.

While local governments are ultimately subject to the state, the current state constitution's article IX, the Bill of Rights for Local Government, provides localities a broad grant to enact land use ordinances that are in furtherance of their police powers. Furthermore, New York's Town Law, General City Law, Village Law, and General Municipal Law empower local governments to establish a plethora of land use controls, including zoning ordinances, comprehensive master plans, subdivision controls, official maps, capital improvement programs, historic districts, and environmental controls.⁸⁵ New York State also vests limited land use authority in the state's 62 counties.⁸⁶ However, the emphasis on local autonomy makes regional land use controls in the Adirondacks and the Long Island Pine Barrens the exception.

Notwithstanding the constitutional and statutory provisions that vest authority in local government, New York State has gained power in land use decision making through environmental statutes and regulations that govern specific areas. Tidal wetlands, freshwater wetlands, mined land reclamation, and other initiatives dealing with water supply and sewage disposal have been the subject of statewide regulation.

Environmental Quality Review

The National Environmental Policy Act (NEPA), signed into law on January 1, 1970, was the first of the great modern environmental statutes. NEPA requires every federal agency proposing a major federal action that may significantly affect the quality of the environment to prepare a detailed statement assessing the environmental impacts and potential alternatives of the proposed action. NEPA also established the Council on Environmental Quality, which was empowered to promulgate binding regulations to guide federal agencies in the application of NEPA's requirements. While decades of case law reconfigured the contours of NEPA, the basic premise of requiring consideration of environmental consequences remains.

Prior to the creation of the DEC in 1970, responsibility for conducting environmental analysis of proposed development was vested in the individual permitting departments.⁸⁷ In 1970 the Office of Environmental Analysis within the DEC assumed this responsibility. The governing DEC regulations were broad; they required the applicant to submit an environmental impact assessment for any proposed project that required a DEC permit, regardless of whether it may have a significant impact on the environment. In 1974 the appellate division held, in *Ton-Da-Lay v. Diamond*, that the state's regulations did not

provide applicants (p. 812) with sufficient guidance on the standards by which permit applications would be reviewed.⁸⁸

The following year the state legislature passed SEQRA. Much like NEPA, SEQRA imposed broad procedural requirements mandating the preparation of an environmental impact statement prior to agency approval of any action that may have a significant effect on the environment.⁸⁹ Critics of SEQRA have argued that the statute creates administrative red tape, impedes economic development, and fails to provide sufficient guidelines on the circumstances under which proposals will be accepted. There is little question, however, that the SEQRA review process and its accompanying public participation requirements have injected environmental considerations into governmental decision making at every level in New York.⁹⁰ SEQRA documentation has become the framework around which state agencies and local governments learn about and consider environmental impacts of proposed actions. SEQRA has also been the most fertile source of environmental litigation in the New York State courts.

Hazardous Waste and Radioactive Waste

New York State became America's industrial heartland during the nineteenth century, driven by coal-fired factories and a massive, willing immigrant workforce. By 1900 New York accounted for one-sixth of the national industrial output.⁹¹ Moreover, as the twentieth century began, the potential to harness the immense hydraulic power of Niagara Falls made the western region the capital of the state's burgeoning industrial economy.⁹² Nikola Tesla, the Austrian-born inventor of alternating current, predicted in the mid-1880s that the electricity generated at Niagara would someday power the streetcars of London and the streetlights of Paris.⁹³ By 1914 a hydraulic canal at the falls, first conceived in 1847, was supplying more than 130,000 horsepower for the rapidly growing industrial presence there. Cheap and accessible energy transformed the region into the world's largest producer of electrochemicals and a major center for the processing of metals, insecticides, pesticides, pharmaceuticals, and hundreds of other chemicals and abrasives.⁹⁴ Under domestic and international competitive pressures, manufacturing industries departed, and the jobs they created went with them. But their waste was left behind. By the 1970s, the once prolific industry had long since departed, but the state faced a multibillion dollar hazardous waste cleanup problem.

Love Canal

Love Canal was excavated by William Love in 1893 in a failed effort to create a second great hydraulic conduit to supply energy to the Niagara Falls region's growing (p. 813) industries. In 1947 Hooker Chemical and Plastics Corporation transformed Love's trench into a hazardous waste disposal site for their chemical and plastic processing operations. After covering the hazardous materials with clay, Hooker sold the land to the Niagara Falls Board of Education for \$1. A school, playground, and more than 100 homes were built in the immediate vicinity. By 1953 the area surrounding the site had become residential.

Then, in 1977, heavy rains brought to the surface in residential backyards, basements, and school playgrounds some of the 21,000 tons of toxic chemicals that Hooker had buried.⁹⁵ Testing revealed that the sludge consisted of 82 industrial chemicals, 11 of which were suspected carcinogens.⁹⁶ The country rallied behind local resident Lois Gibbs, who gave voice to the families' belief that they had suffered horrific health effects from the chemicals.

After visiting Love Canal, Governor Hugh Carey announced that the state would buy the homes of many of the families affected by the contamination. In 1980, a presidential election year in which New York was in play, President Jimmy Carter announced that the federal government would finance \$15 million for the purchase of the remaining homes. The crisis at Love Canal became a national symbol for the problem of toxic waste disposal and helped inspire the nation to enact federal and state legislation in the late 1970s and 1980s.

West Valley

In the late 1950s, after the federal government enacted the Atomic Energy Act, states were encouraged to pursue a policy of peaceful nuclear energy development. Eager to take advantage of federal assistance, New York initiated plans to develop an atomic industrial area in its economically challenged rural southwestern region. In 1961 the state acquired 3,345 acres of land in Cattaraugus County and leased the site to Nuclear Fuel Services (NFS) for reprocessing of nuclear fuel and disposal of commercial radioactive waste.⁹⁷ The facility's 600,000 gallons of high-level radioactive waste was stored in underground concrete-encased stainless steel containers.⁹⁸ In the first few years of operation, NFS experienced a filter blowout and other incidents that led to the radioactive contamination of nearby creeks. Unsure about the future of nuclear energy,

and facing the increased cost of environmental compliance, in 1975 NFS allowed the property to revert to the state.

After the plant ceased operations, it was discovered that at least one of the underground tanks had leaked and that there were numerous other areas of severe environmental degradation. With the Love Canal incident erupting within an hour's drive, Cattaraugus County residents feared becoming the next victim of irresponsible hazardous waste practices. Governor Hugh Carey urged the federal government to pay most of the remediation costs at West Valley. Diligent work by Representative Stan Lundine and Senators Jacob Javits and Daniel Patrick Moynihan resulted in a law requiring the Department of Energy to take the lead in nuclear waste management and remediation at West Valley.

(p. 814) PCBs In the Hudson

Over the course of 30 years, beginning in 1947, General Electric (GE) released large quantities of polychlorinated biphenyls (PCBs), generated in the course of manufacturing capacitors and other electrical equipment at its Fort Edward and Hudson Falls plants, through wastewater outfall pipes and fractured rocks into the Hudson River. The EPA determined PCBs were probably carcinogenic, and in 1976 their use was banned. One year later GE stopped actively discharging them (though some continued to seep out). However, the impact of contamination endured and commercial finishing was banned on the Hudson after high concentrations of PCBs were measured in striped bass and other species.⁹⁹ After a very long, noisy political and legal controversy that pitted GE and many of the communities in the upper Hudson River area (which would be affected by a long dredging campaign) against the EPA and many environmental organizations, the EPA ordered GE to dredge the Hudson to remove the PCBs. Dredging began in 2009.

State and Federal Action

When New York State's environmental apparatus was restructured in 1970, resources for hazardous waste management were not included in the DEC's budget. The legislature vested DEC with regulatory authority over the storage and discharge of hazardous substances in 1972, but did not provide funding. Finally in 1974, \$500,000 was appropriated to create the Division of Solid and Hazardous Waste.¹⁰⁰ However, until 1980 the state funded only one full-time hazardous waste position.

In 1976 Congress enacted the Toxic Substances Control Act to regulate the introduction of new chemicals into commerce. Also in that year the federal Resource Conservation and

Recovery Act (RCRA) created a mandatory regulatory program for hazardous wastes. Two years later, in 1978, the state empowered the DEC to regulate hazardous waste from generation through disposal in the Industrial Hazardous Waste Management Act, and also made the agency eligible to implement the federal law under a delegation agreement. In that same year the legislature enacted laws that governed the siting of hazardous waste disposal facilities and required businesses to develop formal plans for reducing hazardous waste generation.

These laws addressed current operations, but prior practices left a legacy of contamination. In 1980, in the wake of the Love Canal episode, Congress passed and President Carter signed the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or the Superfund Law). It subjected former and current owners, operators, generators, and transporters to strict liability and required that EPA create a National Priority List (NPL) for the sites posing the greatest hazards. Just two years later, the state enacted the New York State Superfund Law (the Inactive Hazardous Waste Disposal Site Remedial Program), similarly empowering the DEC to promulgate its own list of heavily contaminated sites and to oversee their cleanup.

(p. 815) These Superfund programs do not have “super” public funding. The bulk of the cleanup costs have been borne by waste generators and property owners in accordance with the strict liability scheme; the EPA and DEC provide funding only as a last resort. The federal money that has been available in the past came primarily from special taxes on chemical feedstocks and petroleum.¹⁰¹ That tax expired in 1995 and progress slowed, however, the American Recovery and Reinvestment Act of 2009 provided an additional \$528 million for these efforts.¹⁰²

After tackling 401 of its most contaminated sites, New York State announced in March of 2001 that its cleanup fund was completely exhausted. At that time there were 800 sites that were still in need of remediation. In 2003 Governor Pataki signed new legislation authorizing up to \$135 million to reinvigorate the state's superfund and creating the landmark Brownfield Cleanup Program (BCP) to simultaneously facilitate hazardous waste remediation and encourage urban renewal. The 2003 legislation provided developers with liability protections, use-based cleanup guidelines, and most importantly, tax credits.¹⁰³ The program has had problems with cumbersome administrative processes. Additionally, the tax credit formula allowed some large developers to reap hundreds of millions of dollars in credits for very modest cleanups. Amendments to the BCP enacted in 2008 addressed some but not all of these problems.

Municipal Solid Waste

Nineteen million New Yorkers dispose of approximately 14 million tons of refuse annually. The state's transformation, with the help of its localities, of the management of municipal solid waste (MSW) is regarded as one of its greatest environmental success stories. This is an area in which New York has led the nation.

Decades of unrestrained dumping, without regard for environmental and health consequences, led to the operation of approximately 1,600 unregulated open dumps across the state operated exclusively by local governments.¹⁰⁴ To make matters worse, many municipalities built landfills on what was then seen as remote and cheap swamp land, though today we know these sites are ecologically fragile wetlands. As unlined local dumps aged, they leached toxins into the ground that contaminated New York's lakes, rivers, and groundwater supplies.

The Public Health Council's 1962 regulation of these dumps, one of the state's earliest efforts to address the growing problem of environmental contamination, predated federal action. The 1962 regulation required municipalities to convert each open dump into a double-lined sanitary landfill, complete with a system of basins and pipes to collect leachate.¹⁰⁵

In 1965 the federal government enacted the Solid Waste Disposal Act, which provided economic and technical assistance to help municipalities convert open dumps into sanitary landfills. The federal assault against open dumps continued (p. 816) in 1970 when the newly created EPA embarked upon Mission 5000 to encourage municipalities to close 5,000 of the 16,000 open dumps that remained in use across the nation.

While the reorganization plan that led to the creation of the New York State DEC in 1970 did not include waste management, as previously noted, the legislature recognized the void and in 1973 authorized the agency to develop regulations governing landfill operations.¹⁰⁶ Within a year, \$500,000 was appropriated to create the Division of Solid and Hazardous Waste Management. By 1977 the division's recommendations initiated the first comprehensive state regulations to require all active landfills to obtain site-specific permits.¹⁰⁷ In the meantime, at the federal level, subtitle D of the Resource Conservation and Recovery Act required (though somewhat toothlessly) all states to devise comprehensive plans for solid waste disposal.

State and federal regulatory controls resulted in a dramatic increase in the cost of landfill operation, and the state and federal government offered grants, no-interest loans, and other incentive programs to subsidize closure costs.¹⁰⁸ Landfills continued to close, and

only 426 of the original 1,600 landfills were still in operation by 1984.¹⁰⁹ A study commissioned by the State Assembly Ways and Means Committee in 1984 revealed that only 70 of the 426 active landfills had obtained the necessary permits, 61 were under consent order to come into compliance, 48 were known to be contaminating groundwater, and another 200 were believed to be actively releasing pollutants.¹¹⁰

New York's solid waste problems became international news in 1987 when the Mobro Barge, loaded with MSW from Islip, wandered the seas for 156 days while searching for a place to unload its rotting cargo. Eventually, after six states, the Bahamas, Mexico, and Belize rejected Mobro's load, the DEC arranged for the barge to dock in Brooklyn, where the garbage was burned at the Southwest Brooklyn Incinerator.¹¹¹ The humiliating Mobro incident increased interest in sound MSW management and recycling.

Recycling techniques were initially tested as far back as 1898, when New York City established the nation's first rubbish sorting plant. Although these efforts floundered, they resurfaced in 1943 when Mayor LaGuardia endorsed metal recycling to support World War II under the slogan "save some scrap to kill Japs."¹¹² Emphasis again shifted back toward recycling and waste reduction in 1980 when the public outrage over the Mobro incident forced state officials to recognize that arcane methods of disposal had to be replaced.

Governor Hugh Carey made strides toward a renewed emphasis on recycling when he proposed the New York State Returnable Beverage Container Act. Passed in 1982, it required merchants to charge a returnable deposit of five cents on cans and bottles.¹¹³ The "Bottle Bill," as it was called, provided economic incentives for voluntary recycling and a meaningful source of funds for people of limited means. Despite initial complaints from some consumers, and persistent complaints from many beverage retailers, statewide solid waste volume was reduced by 8 percent. It became clear that the Bottle Bill had achieved great success. Amidst debate, the (p. 817) reach of this bill was extended in 2009 to cover bottled water containing sugar and sports drinks.

In 1988 the legislature passed the New York State Solid Waste Management Act (SWMA). SWMA imposed a comprehensive system of waste management that challenged the historically disjointed relationship that had developed between state and local governments. Under SWMA, municipalities retained responsibility for planning and operation, but were required to develop and submit individually tailored solid waste management plans. Furthermore, SWMA provided financial and technical assistance to municipalities that implemented sustainable strategies like waste reduction, reuse, and energy recovery in their waste management plans.¹¹⁴ New solid waste management facilities could not receive state permits unless they were consistent with an approved plan. The state's efforts to encourage recycling bore fruit and, by 1996, the amount of

material diverted from landfills and incinerators to recycling facilities increased by 67 percent from 1990 levels. New York City now recycles 16.6 percent of its waste, incinerates 12 percent in waste-to-energy plants, and transports 71 percent out of state.

In recent years the state has struggled to maintain the careful balance struck by SWMA between state and municipal waste management policy. This issue was brought to light in March 1991 when a large tractor trailer, owned by a private waste management company, crashed while carrying a cargo of waste originating from Clarkstown, New York.¹¹⁵ Authorities soon discovered that C&A Carbone, Inc., had been covertly operating an independent waste disposal business in violation of Clarkstown's Local Law 9, a flow control ordinance that required all of Clarkstown's solid waste to be processed at the municipal transfer station.¹¹⁶ Clarkstown sued Carbone to compel compliance with the city's local law. After success in the state court, the U.S. Supreme Court ruled against Clarkstown and held that the municipal ordinance was an unconstitutional restriction of interstate commerce.¹¹⁷ Ironically, New York City was a major beneficiary, as it came to rely on open borders for shipping its waste in all directions, now that its Fresh Kills landfill is closed.

The Supreme Court's C&A Carbone ruling had a nationwide impact in ensuring a market in solid waste disposal, and making it difficult for state and local governments to close their borders to exports and imports of waste. The decision unraveled the historic focus on local solutions to waste management and shifted the discourse to a regional approach. However, in 2007 the Supreme Court took steps to erode the shift toward regionalization when it ruled that municipalities may impose flow control ordinances if they operate solid waste facilities or otherwise act as market participants.¹¹⁸

New York City

About one-fifth of New York's solid waste is generated in New York City. Haphazard disposal of household trash long plagued New York and other large cities around (p. 818) the world. In 1874 the development of an innovative incineration technology initiated the birth of systematic burning as a widely accepted waste management technique. Soon thereafter, the United States' first permanent incinerator was built in New York on Governor's Island. To supplement incineration, New York relied on waste reduction plants and piggeries, which would house pigs to eat fresh or cooked garbage. Despite the Federal Marine Protection Act's (1888) ban on ocean dumping, Department of Street-Cleaning employees regularly piled the city's refuse on barges, traveled 17 miles out to sea, and shoveled the load into the water.¹¹⁹ When sea disposal was interrupted by inclement weather, the city's trash was unloaded on Rikers Island. Public protest led to a

1894 commission study that recommended a fundamental shift toward incineration and compression.¹²⁰

Nonetheless, local landfills remained to be the most prevalent form of refuse disposal. New York City continued to unload refuse into the ocean despite federal and state prohibitions. After ocean dumping was finally eliminated by the U.S. Supreme Court's seminal 1934 opinion in *New Jersey v. New York*,¹²¹ the city's waste disposal policy again turned toward incineration.

Although many advocates rallied for 100 percent incineration, prior experience taught officials that it would take time to revamp the city's incineration infrastructure, and that an intermediate solution to the city's waste problem would have to be found. Armed with a proposal to use city funds to build the Westshore Expressway, Robert Moses struck a deal to build the Fresh Kills landfill in Staten Island in 1946. Initially intended as a temporary facility, in operation for only three years while the city built up its incineration capacity, Fresh Kills remained in operation for more than 50 years. By 1990 the site received more than 14,000 tons of residential and commercial refuse each day; it was the disposal destination for more than one-third of the total landfilled waste in New York State.¹²²

A New York City law passed in 1951 required that all new apartment houses have an on-site incinerator. Just nine years later, more than one-third of the city's refuse was burned in 22 municipal plants and approximately 17,000 apartment house incinerators throughout the five boroughs.¹²³ After nearly a century of incineration development, the city had finally achieved efficient dependence on the seemingly faultless waste disposal technique. But also in the 1950s consciousness rose about the health hazards of air pollution, and waste incineration was a major source. In 1967 the city passed a law that made unimproved apartment house incinerators illegal. Landfills became the default option.

As late as 1990, 75 percent of New York City's waste and 40 percent of the state's total waste was transported to Fresh Kills landfill for disposal.¹²⁴ Residents of Staten Island were outraged by the odors emanating from the landfill and complained that it had long been operating out of compliance with state law and regulations. But New York City relied heavily on Fresh Kills, and neither the city nor the state took action to propose a viable alternative until 1989, when the state filed an administrative enforcement action to secure an accelerated closure of Fresh Kills landfill.

Few believed this would actually lead to closure. But then in 1994 Rudolph Giuliani was elected mayor of New York City, with solid support from the voters (p. 819) of Staten Island, the city's only mostly Republican borough. With support from Governor George

Pataki, Fresh Kills was closed in 2001, though a few months later it temporarily reopened for the limited purpose of accepting debris from the destruction of the World Trade Center.

New York City was left without any solid waste disposal capacity; its last municipal incinerator had closed, and there was little prospect of a new one, and no possibility at all of a new landfill. Thus there was no alternative but to export. Instead of a fleet of barges carrying garbage to Staten Island, much larger fleets of trucks crossed the bridges and tunnels taking New York City's waste to landfills and incinerators in New Jersey, upstate New York, New England, and many states to the south and west. The city began planning a system of marine transfer stations to reduce the handling costs and truck traffic. This led to a series of local siting disputes, several of which continue to this day. Today, many smaller transfer stations operate in the city; they are disproportionately located in low-income and minority communities, leading to concerns about environmental justice. Meanwhile, New York City's solid waste expenditures have soared as it has had to pay commercial landfills and incinerators to take waste that had previously been cheaply dumped at Fresh Kills.

Air Pollution

New York State has suffered from severe air pollution since the rapid industrialization of the state in the nineteenth century. Factories and, later, electric power plants spewed pollution that created hazy days and brilliant sunsets. The increasing popularity of automobile tourism in the 1930s brought air pollution to previously untouched areas, like the state's treasured forest preserve. As noted earlier, by the 1960s approximately 17,000 apartment house incinerators and 22 municipal facilities were burning more than one-third of New York City's refuse.¹²⁵ To make matters worse, high-sulfur coal had become the chief fuel source for electricity and apartment house heat generation. This led to dangerously high levels of sulfur dioxide, nitrogen dioxide, and particulate matter in the air.

Early concerns about the negative effects of air pollution led to the promulgation of municipal smoke abatement ordinances. The City of Brooklyn in 1895 was one of the first municipalities to enact such a law, and after Brooklyn became a borough of the Greater City of New York in 1898, the consolidated city followed suit.¹²⁶ Despite the appearance of regulatory action, many city ordinances remained unenforced. After New York City released a report that revealed that "New Yorkers lose as much as 45 percent of the sun light at noon by smoke," cities began to invest in science and research.¹²⁷ The state health commissioner requested "the earnest help of every New York citizen in further

reducing the amount of smoke.”¹²⁸ Despite the warnings of health officials, the state failed to take comprehensive regulatory (p. 820) action, and automobiles, electric generating plants, heating systems, and incinerators continued to flood the states airways with carbon monoxide, sulfur, lead, ozone, and particulate matter.

By the 1950s New York officials realized the state could no longer await a federal solution for air pollution control, and in 1957 the legislature enacted the Air Pollution Control Act, with the admittedly modest goal of striking a balance between economic development and the state's “desire to maintain a reasonable degree of purity of the air resources of the state.”¹²⁹ While the act did not transform the general attitude toward air pollution control, its creation of the Air Pollution Control Board (APCB) laid the groundwork for the state's future regulatory efforts. Over the next decade, the APCB developed a comprehensive plan for pollution prevention, promulgated regulations to control incineration, and imposed industrial emissions standards. The phase-out of apartment house incinerators and limitations on the sulfur content of coal began to yield significant benefits.

Modern Regulation

In 1963 Congress established a federal program, administered by the Public Health Service, to address air pollution. The modern Clean Air Act was enacted in 1970. In a marked departure from past state and federal approaches, the 1970 law imposed a system of cooperative federalism that directed the EPA to identify criteria pollutants and set national ambient air quality standards (NAAQS), and mandated that individual states devise state implementation plans (SIPs) to meet and maintain those standards. The act also curbed automobile emissions by authorizing the EPA to regulate engine technology and gasoline additives. Vested with considerable authority, the EPA required automobile manufacturers to achieve a 90 percent reduction in carbon monoxide and hydrocarbon emissions, a 75 percent reduction in nitrogen oxide emissions, and a reduction in the use of lead additives.¹³⁰ The EPA's lead regulations were upheld by the D.C. Circuit, which held that the EPA does not have to wait for scientific certainty prior to regulation.¹³¹ By 1988 airborne lead levels in New York State had fallen by 90 percent.¹³² The EPA and the National Highway Traffic Safety Administration also administer the federal fuel economy standards, which further reduce air pollution by reducing the amount of fuel burned.

The DEC, which had absorbed the air pollution function of the Department of Health with the DEC's creation in 1970, began vigorously addressing the air pollution issue. Almost simultaneously, the booming midwestern energy industry constructed nearly 200 tall emissions stacks, many reaching higher than 500 feet, to allow power plants (mostly

burning coal) to escape regional NAAQS regulatory requirements. Pollutants from the so-called big dirties traveled in wind currents to the Atlantic seaboard where they mixed with moisture and air to create acid rain. By the early 1980s the resultant acid deposition was a major health and environmental concern in the northeast.

(p. 821) In many areas of New York State, acid rain has resulted in widespread vegetation destruction, aquatic death in acidified lakes, respiratory problems in humans, and the deterioration of stone buildings.¹³³ In 1984 New York State enacted the Acid Deposition Control Act (ADCA), and by doing so became one of the first states to address the negative effects of acid deposition on ecosystems, infrastructure, and the economy.¹³⁴ The act mandated a phased reduction of sulfur dioxide and nitrogen oxide emissions at New York facilities and required DEC to set an environmental threshold value for the maximum allowable level of sulfate deposition. The ADCA was a progressive step, but it was fatally limited to establishing controls within New York State, and did not address the transboundary issues that lay at the root of acid deposition.

An interstate solution to acid deposition was finally approved with the passage of the Clean Air Act Amendments of 1990. Congress mandated an incentive-based cap-and-trade system to reduce emissions from large power plants. The system allocated pollution allowances and allowed sources to trade allowances with other sources that could employ pollutant abatement techniques in a more cost-efficient manner. This program has led to a considerable decline in acid rain.

Climate Change

By the 1990s attention was turning to the issue of climate change. In 1992 world leaders gathered in Rio de Janeiro and negotiated the United Nations Framework Convention on Climate Change. President George H. W. Bush supported the agreement, and the U.S. Senate ratified it. However, by 1997, when the principal instrument to implement the framework convention's objectives was negotiated—the Kyoto Protocol—the Senate had become hostile, especially to its provisions imposing binding emissions reduction obligations on developed countries such as the United States and not on rapidly developing countries such as China and India. Thus, while President Clinton and Vice President Gore supported the agreement, they never sent it to the Senate for ratification, as they knew they did not have the votes for its passage. Shortly after taking office in 2001, President George W. Bush disavowed the Kyoto Protocol and signaled that little mandatory regulatory action would be forthcoming from the federal government.

Thus the locus of U.S. activity turned to the states. Governor George Pataki took the lead in forming the Regional Greenhouse Gas Initiative (RGGI), a grouping of 10 northeastern

and mid-Atlantic states that launched a cap-and-trade program for carbon dioxide from large electric power generating stations.

In April 2007 the U.S. Supreme Court issued a landmark ruling in *Massachusetts v. EPA*, holding that the EPA has the authority to regulate greenhouse gases from motor vehicles. President George W. Bush did little with this authority, but with the inauguration of President Obama in January 2009, the EPA began moving swiftly to exercise these powers. Meanwhile, Congress debated comprehensive federal legislation, but the effort stalled in 2010. Until and unless such legislation is enacted, (p. 822) RGGI will continue to play an important role. However, RGGI only regulates electric power plants, and New York's aggregation of electric power plants is relatively clean—the state has considerable hydroelectric and nuclear capacity (leading to no direct generation of greenhouse gases) and natural gas capacity (which is cleaner than oil and much cleaner than coal). In August 2009 Governor Paterson signed an executive order setting a goal of reducing greenhouse gas emissions in the state by 80 percent below 1990 levels by 2050, and he appointed a task force to recommend how to achieve that goal.

Hydrofracking

Climate change is one of the issues lurking behind what, late in the first decade of the twenty-first century, emerged as the latest hot environmental issue: the extraction of natural gas from a geologic formation called the Marcellus shale, that extends across much of the southern tier of New York and into the Catskills. This natural gas had been deemed inaccessible, but new technologies of horizontal drilling and “hydrofracking” (blasting water underground to break up rocks and release the gas) allow vast quantities to be extracted. This would greatly expand the supply of natural gas, allow its substitution for dirtier-burning fossil fuels, and generate a large number of jobs and tax revenues. However, there was great concern that the massive amounts of water required by this operation, the chemical additives, and other associated activities would endanger water supplies and have other adverse environmental impacts. In 2012 DEC—which regulates oil and gas drilling as well as water quality—was struggling with how to cope with this massive new industry.

Conclusion

Over the course of the past 300 years, a pattern of environmental degradation followed by scientific advancement, public awareness, and legal advocacy has resulted in federal, state, and municipal environmental laws and regulations that function to protect New

York's unique environmental resources. The movement to consolidate most of the state's power over environmental matters into one "superagency" has helped New York deal with the interrelated factors that make up our natural environment. Every level of government has been involved (federal, state, and municipal), as has every branch (executive, legislative, and judicial). The complex legal, political, and financial relationships among these levels and branches, combined with the technical difficulties and scientific uncertainties, and the international nature of many of the problems, make environmental protection a challenge whose outcome cannot be foreseen.

(p. 823) New York began the modern era as a vigorous and innovative leader in environmental protection measures, but since the early 1990s, the paralyzing partisanship in the legislature and inconsistent leadership in the governor's office have moved the state considerably further back in the national pack on many environmental issues. Before the advent of modern environmental laws in the 1970s, principal environmental responsibility resided with the states and municipalities. Since then, federal statutes have covered the largest portion of environmental responsibility, and they have typically followed a pattern of federal mandates to be carried out by the states with greater or lesser degrees of discretion.

Notes:

- (1.) While modern New Yorkers tend to forget the legendary impact of sanitation and modern engineering, the *British Medical Journal* confirmed its role in societal advancement when it revealed that sanitation may have been one of the most important medical advances since the 1840s. Annabel Ferriman, "BMJ Readers Chose Sanitation as the Greatest Medical Advance Since the 1840s," *British Medical Journal* 334 (January 2007): 111.
- (2.) Environmental Conservation Law, art. 8, sec. 109 (2010).
- (3.) *Scenic Hudson Preservation Conference v. Federal Power Commission*, 354 F.2d 608 (2nd Cir. 1965).
- (4.) *Sierra Club v. US Army Corps of Engineers*, 701 F.2d 1011 (2nd Cir. 1982).
- (5.) *C&A Carbone Company v. Town of Clarkstown*, 511 U.S. 383 (1993). Subsequent decisions have defined certain ways that localities can bar waste generated outside of their jurisdictions. See, e.g., *United Haulers v. Oneida-Herkimer Solid Waste Authority*, 550 U.S. 330 (2007). State and federal courts have also played a major role, for example,

in initiating land preservation efforts at Long Island Pine Barrens and molding the contours of state and federal Superfund and Brownfield legislation.

(6.) Rockefeller Institute of Government, *Preserve and Protect: Challenges Facing New York's State Park System* (Albany, NY: SUNY Press, 1993), 12.

(7.) Rockefeller Institute of Government, Center for New York State and Local Government Studies, *A 25th Anniversary Review* (1996), 5-11; Robert H. Connery and Gerald Benjamin, *Rockefeller of New York: Executive Power in the Statehouse* (New York: Cornell University Press, 1979), 163-167.

(8.) New York State Department of Health, "Drinking Water Program Facts and Figures," http://www.health.state.ny.us/environmental/water/drinking/facts_figures.html.

(9.) Mario Cuomo, *The New York Idea: An Experiment in Democracy* (New York: Crown, 1994), 15-16; U.S. Geological Survey, "Programs in the Great Lakes," <http://water.usgs.gov/wid/html/gl.html>.

(10.) Diane Galusha, *Liquid Assets: A History of New York City's Water System* (New York: Purple Mountain Press, 1999), 11.

(11.) Galusha, *Liquid Assets*, 13.

(12.) Galusha, *Liquid Assets*, 15; Gerard T. Koeppel, *Water for Gotham* (Princeton, NJ: Princeton University Press, 2000), 98.

(13.) Galusha, *Liquid Assets*, 15.

(14.) Galusha, *Liquid Assets*, 16; Koeppel, *Water for Gotham*, 135.

(15.) Lake Manahatta, which is now Jacqueline Kennedy Onassis Reservoir in Central Park, was added to the Croton system as a storage body in 1862.

(16.) Galusha, *Liquid Assets*, 68.

(17.) Koeppel, *Water for Gotham*, 289.

(18.) Rondout Reservoir in 1950, Neversink in 1954, Pepacton Reservoir in 1955, and finally Cannonsville Reservoir in 1964.

(19.) Although federal laws regulated water quality, responsibility for nonpoint source pollution was largely delegated to the states. Like many states, New York had not acted to control nonpoint source pollution. In the late 1980s, the state still relied on antiquated

New York City Department of Sanitation regulations to protect New York City's water supplies.

(20.) The MOA ensured water quality that would qualify the city for a federal filtration avoidance certificate and allow it to avoid massive expenditures for the installation of a filtration system, as otherwise required by the Surface Water Treatment Rule.

(21.) New York City Department of Environmental Protection, "History of New York City's Water Supply System," http://www.nyc.gov/html/dep/html/drinking_water/history.shtml.

(22.) New York City Department of Environmental Protection, "City Water Tunnel No. 3," <http://www.nyc.gov/html/dep/pdf/factsheet.pdf>.

(23.) Scott Cuppet and Russell Urban-Mead, *Hudson Valley Water: Opportunities and Challenges*, Center for Regional Research Education and Outreach, State University New York, New Paltz, NY, 2010, 2.

(24.) Cuppet and Russell Urban-Mead, *Hudson Valley Water*, 2.

(25.) City of Rochester, "Hemlock Lake," <http://www.cityofrochester.gov/article.aspx?id=8589936601>.

(26.) Brad Edmondson, *Environmental Affairs in New York State: An Historical Overview* (Ithaca, NY: New York State Archives, 2001), 12.

(27.) Cuomo, *The New York Idea*, 215-216.

(28.) Council of Great Lakes Governors, "Overview: About Us," <http://www.cglg.org/Overview/index.asp>.

(29.) Mark Sproule-Jones, *Restoration of the Great Lakes: Promises, Practices and Performances* (Vancouver, BC: University of British Columbia Press, 2002), 3-11.

(31.) Glenn Harris and Seth Wilson, "Water Pollution in the Adirondack Mountains," *Environmental History Review* 17, no. 4 (Winter 1993): 48.

(32.) Robert B. Ward, *New York State Government* (Albany, NY: SUNY Press, 2006), 495.

(33.) Eric A. Goldstein and Mark A. Izeman, *The New York Environment Book* (Washington, DC: Island Press, 1990), 48.

(34.) New York State continues to struggle with poor sewage infrastructure. Today there are more than 460 combined sewage overflow outfalls that discharge more than 27 billion

gallons of raw sewage and polluted storm water into the Hudson River and New York Harbor annually.

(35.) Seth G. Hess, "Work of the Interstate Sanitation Commission," *American Journal of Public Health and the Nation's Health* 36 (December 1945): 1299.

(36.) Rockefeller Institute, *25th Anniversary Review*, 82.

(37.) Clean Water Act, 33 U.S.C § 1251 (2010) (originally enacted as the federal Water Pollution Control Act).

(38.) David Maldwyn Ellis, *New York State and City* (Ithaca, NY: Cornell University Press, 1979), 138.

(39.) Sixty percent of wetlands existing in 1790 were destroyed by 1980. "Wetlands," *The Encyclopedia of New York State* (Syracuse, NY: Syracuse University Press, 2005).

(40.) Philip Weinberg, "Safeguarding 'An Invaluable and Irreplaceable Resource': The Genesis of New York's Wetlands Laws," *New York State Bar Association Journal* (July/August 2009): 47.

(41.) Although Emmons believed "Adirondacks" was the name of an American Indian tribe that had once used the region as a hunting ground, it is now widely thought that the term was originally used by Iroquois to identify Algonquin "tree-eater" groups that lived on buds and bark during harsh winters.

(42.) Roy Rosenzweig and Elizabeth Blackmar, *The Park and the People: A History of Central Park* (New York: Cornell University Press, 1992), 81.

(43.) "Environmentalism," *The Encyclopedia of New York State* (Syracuse, NY: Syracuse University Press, 2005).

(44.) Edmondson, *Environmental Affairs in New York State*, 17.

(45.) Philip G. Terrie, *Contested Terrain: A New History of Nature and People in the Adirondacks* (Syracuse, NY: Syracuse University Press, 1997), 89.

(46.) Edmondson, *Environmental Affairs*, 17.

(47.) In 1883, ten years after the commission report, the legislature finally began to heed the warnings of environmentalist and prohibited the sale of state lands in 10 Adirondack counties. Alf Evers, *The Catskills: From Wilderness to Woodstock* (Garden City, NY: Doubleday, 1972), 583.

(48.) Charles M. Dow, *The State Reservation at Niagara* (Albany, NY: J. B. Lyon, 1914), 14. See also *Annual Reports of the Commissioners of the State Reservation*, XIX, 21–22.

(49.) William Irwin, *The New Niagara: Tourism, Technology and the Landscape of Niagara Falls, 1776–1917* (University Park, PA: Pennsylvania State University Press, 1996), 78.

(50.) Edmondson, *Environmental Affairs*, 8; see F. A. de Chateaubriand, *Recollections on Italy, England and America* (London: Shulte and Dean, 1816), quoted in Roderick Nash, *Wilderness and the American Mind* (New Haven, CT: Yale University Press, 1967), 49.

(51.) Charles Fenno Hoffman, “Wild Scenes Near Home: or Hints for a Summer Tourist,” *American Monthly Magazine* II (1836): 469–478; Edmondson, *Environmental Affairs*, 9.

(52.) Tourists swarmed to hotels like Paul Smith's, an intellectual haven that opened in 1861, and Prospect House, which was the first hotel to provide electric light in every guest room.

(53.) Trudeau also established a tuberculosis laboratory at the same site where he tested his hypotheses that rest and fresh air could have a beneficial effect on his patients.

(54.) Roger C. Thompson, “Politics in the Wilderness: New York's Adirondack Forest Preserve,” *Forest History* 6, no. 4 (Winter 1963): 16.

(55.) New York State Constitution, art. XIV, sec. 1 (originally in art. VII of the 1894 Constitution). See William R. Ginsberg “The Environment,” in *Decision 1997: Constitutional Change in New York*, ed. Gerald Benjamin and Henrik N. Dullea (Albany, NY: Rockefeller Institute Press, 1997), 318–320.

(56.) In 1898 legislation was passed to allow Cornell University to create a State College of Forestry, where Bernhard Fernow would conduct an unsuccessful 30-year forest management experiment on 30,000 acres of Adirondack land.

(57.) Edmondson, *Environmental Affairs*, 25.

(58.) Evers, *The Catskills*, 585.

(59.) Natural Resources Defense Council, *Land Use Controls in New York State*, ed. Elaine Moss (New York: Dial Press, 1975), 133.

(60.) Evers, *The Catskills*, 585–589.

(61.) Rockefeller Institute, *25th Anniversary Review*, 53.

(62.) Mary Jo Fairbanks, ed., *A Guide to New York State Government* (New York: Policy Studies Association, 1989), 134.

(63.) In 1927 the state replaced the Conservation Commission with the Conservation Department and placed the Division of Parks under its control in a second effort to restructure the state's park system. This attempt at centralization was as ineffective as Governor Smith's initial attempt because Moses' State Council of Parks and eight regional commissions retained significant control.

(64.) However, Moses' biographer, Robert Caro, claims that Moses intentionally designed the bridges over the Long Island parkways to be so low that buses—which would presumably carry poor people—could not travel them. Robert Caro, *The Power Broker: Robert Moses and the Fall of New York* (New York: Random House, 1975), 951–954. More recently, this claim has been vigorously contested. Bernward Joerges, “Do Politics Have Artefacts?”, *Social Studies of Science* 29/3 (June 1999), 411–431.

(65.) Connery and Benjamin, *Rockefeller of New York*, 173.

(66.) The story of Moses' resignation at the hands of Governor Rockefeller is very interesting. Many people revered Moses for his long history of achievements, and he initially refused to resign, claiming that he would resign all other public service if he was forced out by Rockefeller. Eventually pressure became insurmountable, and Moses agreed to step down, allowing Governor Rockefeller to avoid a termination decision that could have injured his administration.

(67.) Rockefeller Institute of Government, *Preserve and Protect*, 16.

(68.) Connery and Benjamin, *Rockefeller of New York*, 344.

(69.) Connery and Benjamin, *Rockefeller of New York*, 344.

(70.) Terrie, *Contested Terrain*, 167.

(71.) SLMP placed broad restrictions of further development on state-owned lands and partitioned land into four scaled categories under which different levels of development would be permitted.

(72.) Jane Keller, *Adirondack Wilderness: A Story of Man and Nature* (Syracuse, NY: Syracuse University Press, 1980), 215.

(73.) Although development in hamlets and towns remained relatively unrestricted, lands designated as resource management areas, in which the lowest level of development was

permitted, totaled 1.9 million acres, spanning a massive 53 percent of the park's private land.

(74.) Anthony N. D'Elia, *The Adirondack Rebellion* (New York: Onchiota Books, 1979).

(75.) Barbara McMartin, *Perspectives on the Adirondacks* (Syracuse, NY: Syracuse University Press, 2002), 103.

(76.) McMartin, *Perspectives on the Adirondacks*, 105.

(77.) Sam Verhovek, "Cuomo Accused of Abandoning the Adirondacks," *New York Times*, <http://www.nytimes.com/1990/09/24/nyregion/cuomo-accused-of-abandoning-the-adirondacks.html>.

(78.) Natural Resources Defense Council, *Land Use Controls*, 133.

(79.) Natural Resources Defense Council, *Land Use Controls*, 136.

(80.) Central Pine Barrens Joint Planning and Policy Commission, "The Central Pine Barrens Region," <http://pb.state.ny.us/>.

(81.) Sarah Lyall, "Pine Barrens Lawsuit Halts Long Island Builders," *New York Times*, <http://www.nytimes.com/1990/05/08/nyregion/pine-barrens-lawsuit-halts-li-builders.html?pagewanted=all&src=pm>.

(82.) *In the Matter of Long Island Pine Barren Society v. Planning Board of the Town of Brookhaven et al.*, 606 N.E.2d 1373. (N.Y. 1992).

(83.) Stephen L. Kass and Michael B. Gerrard, "Pine Barrens: The Fruitful Compromise," *New York Law Journal* (August 27, 1993), p. 3.

(84.) New York State Constitution, art IX, sec. 1, cl. 1.

(85.) Natural Resources Defense Council, *Land Use Controls*, 26.

(86.) Natural Resources Defense Council, *Land Use Controls*, 62-63.

(87.) Terence Curran and Thomas W. King, Jr., "NEPA and a State's Role in Water Resources Management," *Journal of the American Water Resources Association* 10, no 1. (February 1974): 127-136.

(88.) *Ton-Da-Lay Ltd v. Diamond*, 355 NYS 2d 820 (3rd Dept. 1974).

- (89.) Gary Weiskopf and David L. Markell, "Environmental Policy in New York," in *Governing New York State*, 4th ed., ed. Jeffrey M. Stonecash (Albany, NY: SUNY Press, 2001), 337.
- (90.) Thomas Birkland, "Environmental Policy in New York State," in *Governing New York State*, 5th ed., ed. Robert F. Pecorella and Jeffrey M. Stonecash (Albany, NY: SUNY Press, 2006), 395–397.
- (91.) Ellis, *New York State and City*, 140.
- (92.) As entrepreneurs and scientists salivated over the power of the falls, environmentalists worked to preserve its unmatched beauty. See the "Parklands" section for more information on the movement to preserve Niagara Falls and the opening of Niagara Falls State Reservation in 1885.
- (93.) Patrick V. McGreevy, *Imagining Niagara: The Meaning and Making of Niagara Falls* (Amherst, MA: University of Massachusetts Press, 1994), 107.
- (94.) Irwin, *The New Niagara*, 146–151.
- (95.) Rockefeller Institute, *25th Anniversary Review*, 77; Daniel C. Kramer, *The Days of Wine and Roses are Over: Governor Hugh Carey and New York State* (Lanham, MD: University Press of America, 1997), 215.
- (96.) Kramer, *The Days of Wine and Roses*, 215.
- (97.) The site was called the Western New York Nuclear Services Center (WNYNSC).
- (98.) "History," Coalition on West Valley Nuclear Wastes, <http://www.highwayendfilms.com/digitup/history.html>.
- (99.) Goldstein and Izeman, *New York Environment*, 187.
- (100.) Rockefeller Institute, *25th Anniversary Review*, 65.
- (101.) Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. § 9611 (2010).
- (102.) "Stimulus Package Provides Half a Billion Dollars For Pollution Fight," *Huffington Post*, April 15, 2009, http://www.huffingtonpost.com/2009/04/15/stimulus-package-provides_n_187417.html.
- (103.) Ward, *New York State Government*, 499.

(104.) Ward, *New York State Government*, 496.

(105.) Ward, *New York State Government*, 496.

(106.) Natural Resources Defense Council, *Land Use Controls*, 9; Edmondson, *Environmental Affairs*, 48.

(107.) Rockefeller Institute, *25th Anniversary Review*, 70.

(108.) For example, in 1986 the state passed the Environmental Quality Bond Act, which made \$100 million available to close the state's noncomplying landfills.

(109.) Rockefeller Institute, *25th Anniversary Review*, 71.

(110.) Rockefeller Institute, *25th Anniversary Review*, 71.

(111.) Rockefeller Institute, *25th Anniversary Review*, 72.

(112.) Benjamin Miller, *Fat of the Land: Garbage in New York the Last Two Hundred Years* (New York: Four Walls Eight Windows, 2000), 207.

(113.) Kramer, *The Days of Wine and Roses*, 221.

(114.) Rockefeller Institute, *25th Anniversary Review*, 72; Goldstein and Izeman, *New York Environment*, 20.

(115.) Gerald Benjamin and Richard P. Nathan, *Regionalism and Realism* (Washington, DC: Brookings Institution Press, 2001), 227-228.

(116.) In the 1990s flow control ordinances were a popular municipal tool used to ensure that a reliable flow of waste would be available so that the investment in costly municipal facilities would be recouped.

(117.) *C&A Carbone Company v. Town of Clarkstown*, 555 U.S. 383 (1993).

(118.) *United Haulers v. Oneida-Herkimer Solid Waste Authority*, 550 U.S. 330 (2007).

(119.) Miller, *Fat of the Land*, 70, 231.

(120.) Plans for an incineration process that would also generate electricity were squashed by Mayor McClellan and others who failed to have the same foresight and believed that waste-to-energy (WTE) plants provided under-the-table rewards for utility companies.

(121.) *State of New Jersey v. City of New York*, 290 U.S. 237 (1934).

(122.) Goldstein and Izeman, *New York Environment*, 10.

(123.) Goldstein and Izeman, *New York Environment*, 32.

(124.) A total of 4.4 percent was burned at municipal incinerators, 8.1 percent was burned at improved apartment house incinerators, and the remainder was disposed of at small local landfills or exported outside of the state.

(125.) Goldstein and Izeman, *New York Environment*, 32.

(126.) Esther Roditti Schachter, *New York City Air Pollution Control Enforcement* (manuscript, Center for Policy and Research, 1971), 10.

(127.) H. E. M., "Smoke Abatement in New York City," *Canadian Medical Association Journal* 22, no. 1 (October 1929): 93-94.

(128.) H. E. M., "Smoke Abatement in New York City," 93-94.

(129.) Ward, *New York State Government*, 491.

(130.) Goldstein and Izeman, *New York Environment*, 96. The federal government's efforts to curb the effect of motor vehicles would be strengthened in 1990 when New York adopted the stringent California Low Emissions Vehicle program. Cuomo, *The New York Idea*, 212.

(131.) *Ethyl Corp. v. EPA*, 541 F. 2d. 1 (D.C. Cir. 1976).

(132.) Airborne lead levels fell by 90 percent as compared to 1973 levels. Goldstein and Izeman, *New York Environment*, 105.

(133.) Birkland, "Environmental Policy in New York State," 404.

(134.) Fairbanks, *A Guide to New York State Government*, 126.

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