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Séminaire

## *Une histoire environnementale de la planification métropolitaine*

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# Protecting Water and Woods: Urban Drinking Water Supplies and Forest Land Protection in the American Northeast

par Ellen Stroud

## Résumé

Environmental Historian Ellen Stroud draws on her research into unexpected connections between urban growth and the resurgence of forests in the early-twentieth-century American Northeast to explore the implications of those connections for safeguarding twenty-first century urban water supplies. Seemingly wild landscapes have long been intricately entangled with the region's cities and towns, and protecting drinking water for the region's cities has been a major driver of forest establishment and protection efforts there. State and national forests were established a century ago in part to provide buffers for the rivers and reservoirs on which Philadelphia, New York City, Boston, and dozens of smaller municipalities depend. Those publicly-owned parcels, along with tax structures and watershed management policies promoting forest cover on privately owned lands, has allowed New York City and Boston, for example, to avoid building costly water filtration plants.

However, twenty-first century suburban and ex-urban sprawl are putting increasing development pressures on the region's privately owned forest lands in particular. Despite the protection offered by state and federal forests, the water supplies of northeastern cities are increasingly dependent on the protection of privately owned woods, requiring new strategies for keeping drinking water safe. More than ever, healthy urban environments are dependant on the integrity of ecosystems far from the city line, and understanding the long history of that connection can inform policies to promote the health of cities and also the forests they helped to create a century ago. Forest management and urban water supply protection are best accomplished in concert with one another, despite often seeming as though they occupy entirely distinct policy spheres.

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In 2017, when Health Commissioner Dr. Mary Bassett heralded New York City's water as "the champagne of tap water," and the city celebrated receiving a new 10-year waiver of the federal requirement to filter urban drinking water supplies, the metropolis was reaping the rewards of over a century of resource stewardship. Careful management of forested watershed lands upstate was continuing to keep the city's water pure, allowing New York City to avoid the hefty expense of building multiple filtration plants. The federal waiver of the filtering requirement is rare in the United States, and one that New York City has taken pride in securing ever since the U.S. Environmental Protection Agency began enforcing the filtration rule in 1993. Without the waiver, New York City would have to spend upwards of \$10 billion to build a water filtration system to comply with federal regulations, and then another \$100 million or more each year in operations costs. Those avoided expenses make the almost \$3 billion the city has spent in the past three decades to safeguard its watersheds seem a bargain. <sup>[1]</sup>

About 40% of the land buffering New York City's upstate reservoirs is forest or park land owned by the city, or by the state. Other forested parcels in the watershed are privately owned, as are the farmland, homes, and businesses that dot the mountain landscape of much of rural and small-town upstate New York. There are three systems involved in delivering over a billion gallons of water from those mountains to the city each day, and the two largest, the Catskill and Delaware systems, are the ones with filtration waivers. The Croton system, which is the oldest of the three and which has reservoirs closer to the city, supplies about 10 percent of the city's water, and has had to be filtered since 2015, but management efforts have so far proved sufficient to avoid that fate for the rest. Since the majority of the watershed land is private property, keeping New York City's water safe (and avoiding costly filtration requirements) has meant the city investing in infrastructure and regulating development far from home. The state granted the city broad authority to manage its upstate watershed back in 1909, and almost a century later, the city's efforts included subsidies for sewage treatment plants for small municipalities, designing new run-off management plans for dairy farms, and imposing strict regulations on septic systems for private homes. <sup>[2]</sup>

Some might criticize the limits on development inherent in New York City's watershed protection efforts as an example of hydraulic imperialism. And indeed, many property owners in the upstate watersheds would agree, resenting the long arm of city regulation, and arguing that they are being unfairly limited in what they can do with their land. Other land owners, though, have welcomed the conservation measures and the protections they have offered for some land uses, such as farming, that might otherwise have been priced out of the region. I would argue that the regulations are better understood not as imperialism of the city, but as forward-thinking planning that has acknowledged the unavoidable connections between cities and their hinterlands instead of imagining those connections away, and in doing so, has ultimately benefited both.

New York City and Boston, the only other large city in the eastern United States not required to filter its water supply, capitalized on the expertise of engineers, scientists, and forest and water advocates in the late nineteenth and early twentieth centuries. Much of that expertise came from Pennsylvania, where urban reformers were among the first in the United States to insist on connections between healthy cities and distant forests, and while Philadelphia ultimately could not boast the success of New York City and Boston, its early experiences paved the way for those later achievements. Pennsylvanians demonstrated the potential for cities and forests to grow together, and show us that even a century and a half ago, people understood that urban, rural, and forest landscapes are interdependent and intertwined. The flow of water makes those connections especially clear.

Philadelphia was an early pioneer in providing water to its populace. In 1801, when the city had only just lost the nation's capital to Washington D.C, and was still the young country's most populous urban place, it also became the first American city to build a municipal water supply system. Designed by engineer Benjamin Henry Latrobe, the system involved steam pumps at an intake station on the Schuylkill River to the city's west. The pumps brought water high enough out of the river to flow by gravity through wooden pipes to an elaborate building at Centre Square, where Philadelphia's City Hall now stands. Inside the building, another set of steam pumps pushed the water up to two water tanks enclosed in the top of the building. All Philadelphians able to pay a fee and build a connection to the main distribution pipes constructed throughout the city could have access to this river water from outside the built-up area. <sup>[3]</sup>

But despite the Center Square Station being an engineering marvel, it proved insufficient for the city within 15 years, and a new reservoir and pumping station were built on a hill on the edge of town, where the city's Art Museum now sits, on the banks of the Schuylkill River. But the city soon learned that providing water and providing clean water were not one and the same. Pollution, especially from industrial development along the river, was threatening the water supply. And so the city began a land purchasing program in 1843, and in 1855, it designated the riverbank area as Fairmount Park, which would become one of the largest municipal parks in the country, now totaling over 9000 acres of protected land, much of it in trees, providing a buffer for the river that provides much of the city's water. <sup>[4]</sup>

As cities boomed elsewhere in Pennsylvania in the late nineteenth and early twentieth centuries, their advocates looked to Philadelphia for lessons on water supply development and protection, recognizing early on just how much benefit city dwellers could draw from forested land. The experiences of forest advocate and urban reformer Mira Dock, in particular, illustrate just how clearly some observers grasped the permeability of human-built and seemingly wild spaces in the region over a century ago.

Dock, a Harrisburg resident who had studied botany at the University of Michigan, was in her mid-forties when she began traveling throughout Pennsylvania in the 1890s to speak on behalf of trees. Through her public lectures punctuated with glass lantern slides of both beautiful and devastated spaces, Dock worked tirelessly to convince her listeners that their wealth, health and future depended on the woods. She explained that trees were Pennsylvania's most critical resource, and that safeguarding the states' remaining woods and replanting its bare hills and fields were essential to protect wood, water, and soil, as well as the health and welfare of the region's residents, both within cities and outside. <sup>[5]</sup>

Dock's passion for trees had less to do with love of nature, she claimed, than with love of people. She explained that her intense interest in forestry had arisen from seeing a colony of woodcutters thrown out of work after a forest fire, and since then, she had learned how crucial forested lands were to protecting the health and viability of communities throughout the state. People and trees, in Dock's experience, depended on one another, particularly when it came to water supplies. Forests were crucial for maintaining stable watersheds, and the trees were disappearing. <sup>[6]</sup>

When she first started out, Dock most frequently spoke to audiences of women, and she framed her comments in language that would appeal specifically to them. Her rhetoric seems familiar at first: like many men and women in the closing years of the nineteenth century, Dock believed fervently that cleaner, more organized, more beautiful cities would be healthier, safer places to live. She was an enthusiastic participant in the turn-of-the-century City Beautiful movement, and like many of her contemporaries, she drew on women's socially-acknowledged authority over order and cleanliness at home to claim a broader political role of seeing to the health, safety, and comfort of the city as a whole. <sup>[7]</sup>

The women's clubs and civic associations that invited Dock to speak wanted to hear her ideas on "Village Improvement," and "How to Make a Town or City More Beautiful." She gave them what they were looking for, speaking in enthusiastic support of creating parks, planting shade trees, and improving garbage collection. Trees, she argued, made a city more livable and lovely, and beauty brought with it physical, mental, moral and financial benefits. Women, she told her audiences, had a particular obligation to beautify their towns. To drive her point home, she took liberties with the gender of a common personification of the United States: Uncle Sam. "Poor Uncle Sam has no wife but Columbia, who stands on a pedestal with long clothes draped about her and looks down on us all," she insisted. "What he needs is a real 'Aunt Sam' who will see to the housekeeping." Yet Dock's "Aunt Sam" would not be content with tidying street corners and planting shrubs. As a trained scientist who was rapidly becoming a recognized expert on forests, she wanted to foster in both women and men an understanding of cities' dependence on trees beyond downtown. <sup>[8]</sup>

In the 1890s and early 1900s, Dock and women and men like her pressed their contemporaries think more seriously and in more sophisticated ways about the importance of forests, which were fast disappearing from the region when they weren't already gone. To win public support for reforestation efforts, activists like Dock drew on aesthetic and romantic ideas about the value of trees, but they underscored their points with a forceful scientific

claim: a region without forests would be a region without water. Cities were dependent on forests to slake their thirst. <sup>[9]</sup>

Pennsylvania is thick in trees today because a century ago, experts like Dock and their receptive audiences in cities and towns throughout the state demanded that forests be re-established on denuded lands. At the end of the nineteenth century, after decades of timber-harvesting and of land-clearing for both agriculture and industry, less than 40 percent of Pennsylvania was in woods. The citizenry worried that in a few decades, even those trees would be gone, leaving the state bereft not only of lumber, fuel, and the income of the lucrative timber industry, but of potable water as well. Losing forests, city residents were coming to understand, meant suffering increasing siltation in streams, losing buffers against water pollution, and having less water held in soils to fend off both flood and drought. And the trees were almost gone. <sup>[10]</sup>

At the urging of urban residents who were fearing for their water supplies, the Pennsylvania State Legislature created a forest commission in the early 20<sup>th</sup> century, and charged it with studying the watersheds of the state to determine how they might best be protected. Shortly after the commission was established, it was given authority and funds to begin purchasing land, which the legislature specified would “become part of a forestry reservation system, having in view the preservation of the water supply at the sources of the rivers of the State, and for the protection of the people of the Commonwealth and their property from destructive floods.” Mira Dock became one of the commission’s first members and traveled extensively throughout the state on speaking engagements and forest commission business. She advocated for the protection of the watershed of her home town of Harrisburg, and also for protecting the watersheds of Philadelphia and Pittsburgh on either side of the state. She spoke forcefully about the ramifications that actions throughout the state’s watersheds had for people downstream, pushing to create an expanded role for both the state and the federal government in managing the watersheds of major rivers. <sup>[11]</sup>

By 1904, the state had acquired over a half million acres of forest reserve land, most of it cobbled together from parcels that had been abandoned by previous owners, often after stripping the land of trees. Rebuilding the forests would take years. But Mira Dock was soon calling on other states and the federal government to emulate Pennsylvania’s success in forest and watershed management. In a 1908 letter to Thomas Will, the Secretary of the American Forestry Association, Dock touted the “remarkable work” being done by Pennsylvania state agencies in protecting the resources of both the state and the nation. Indeed, she wrote, the only waters of the nation’s capitol’s major river, the Potomac, that were in any degree protected were “within the boundaries of Pennsylvania, where in fact they [were] triply protected by the State Forest, Water and Health Departments.” The national organization should, she argued, both learn from Pennsylvania’s actions, and devote more space in its publication *Forestry and Irrigation* to the state’s dramatic success. By 1914, the state controlled over one million acres, and by the end of the twentieth century, there were over 2 million acres of state forest reserves, and another half million acres of forests in state parks and game lands. <sup>[12]</sup>

And activists concerned with watersheds were also the moving force behind the creation of the half-million acre Allegheny National Forest in 1923. Both the Pennsylvania Water Supply Commission and the Pennsylvania Forest Commission voiced strong support of the creation of the National Forest to protect the Allegheny River. The Weeks Act of 1911, which authorized acquisition of lands for national forests in the East, drew its authority from the federal governments’ jurisdiction over navigable waterways. As is so often the case in the United States, the power to regulate interstate commerce provided the constitutional justification for other powers not explicitly granted in that document. Before the passing of the Weeks Act, there had been no mechanism by which the federal government could acquire land to create a national forest in the East. The connection between water and forests, however, provided a route. Rivers needed forests, and cities needed rivers, and rivers carried trade goods across state lines: the federal government could be involved, and the Allegheny National Forest is one of that new legislation’s earliest legacies. <sup>[13]</sup>

The campaigns of Dock and her allies were successful: at the end of the twentieth century, far from being faced with a timber famine, almost two-thirds of the state was covered in trees, with large portions of the new forests on publicly-owned land. And in addition to new woods on land protected as municipal parks and in state and national

forests, many acres on privately-owned parcels also owed their forest cover to early twentieth-century campaigns, having been planted in trees from state nurseries a century before. While development pressures have threatened some of that forest land over the course of the past hundred years, as of 2022, over 5 million acres of privately-owned woods were protected in at least some measure under Pennsylvania's "Clean and Green" program, which offers tax benefits to owners who keep the land in trees. <sup>[14]</sup>

These new forests are artifacts of twentieth-century urban growth, and are tangible evidence of the power and influence that city residents wielded over landscapes far from their homes. All of this means that millions of acres of new forests in Pennsylvania can be directly linked to efforts to secure drinking water for urban residents. In the twentieth century, most cities – both in Pennsylvania and elsewhere – added water treatment and filtration plants to their municipal supply systems, no longer depending on forests alone to protect the supply. Nevertheless, residents of over 100 municipalities in Pennsylvania depend in part on state forests to protect the water they drink. <sup>[15]</sup>

Despite Pennsylvania's early innovations and successes, its largest city, Philadelphia, did not benefit as much as it might have from the early recognition of connections between healthy drinking water and robust forests; the city suffered for being an early adopter of engineering technology. The forested buffer along the urban river could only do so much work. Today, the city has three water pollution control plants, two for water coming from the Schuylkill River, and one for water from the Delaware. <sup>[16]</sup>

New York City and Boston, on the other hand, built their first public water supplies after Philadelphia had made its early mistakes. That, along with the fact that those two cities faced not only industrial pollution but also the influx of brackish tidal water in their closest rivers, meant that they looked further upstream to establish their tree-buffered water supplies – first well outside the city limits in each case, and then halfway across the state. And the establishment of those distant, forest-protected reservoirs in the first years of the twentieth century has meant that Boston and New York are two of only five large urban water-supply systems in the United States that are not yet required to filter all of their water. The other three cities are in the West: San Francisco, whose Hetch-Hetchy reservoir is famously protected by the national lands of Yosemite National Park; Seattle, Washington, which owns 100% of its Cedar River Watershed; and Portland, Oregon, whose Bull Run watershed is 95% owned by the US Forest Service. In contrast, Boston owns just under 50% of Boston's watershed, with another 20% under some form of public control, and New York City owns only 16.7% of its almost 2000 square mile watershed, with another 20 percent under some other form of state or local control. <sup>[17]</sup>

And yet, despite the majority of Boston and New York City's watersheds being privately owned, both cities have continued to receive waivers from the federal government allowing them to avoid building water filtration plants, because they have so far been successful in working with private landowners to manage lands to the benefit of both city and hinterlands. Innovations in tax policies, conservation easements, and land trusts offer hope for continued protection, staving off timber harvests and suburban sprawl that would ultimately impoverish not only urban centers, but also the forested land on which they depend for their water, and the property owners of that land, and other residents nearby. Rural areas that might otherwise have had agricultural and recreational uses crowded out by indiscriminate sprawl have instead remained green. And while the policies that have made that possible might hinder some property owners who wish they could sell to the highest-bidding developer, those same policies benefit farmers and other land owners who value the current character of the landscape and have few tools of their own to preserve it. I would argue this is not the hydraulic imperialism of the cities, but rather a recognition of the shared interests of the city and the hinterland, and of those who value the distinct character of each, in protecting both water and woods. <sup>[18]</sup>

In the American Northeast, built and rebuilt by so many generations of residents and their shifting economic interests and priorities, urban environments have long been visibly intertwined with distant places. City dwellers are dependent on "natural" resources and landscapes, both inside their own boundaries and within their growing reach. Reservoirs, forests, buildings, roads, railways, animals, and the city, small-town, and rural residents who have shaped and been shaped by them all, are each integral components of the region's ecological systems. Parks, forests, reservoir shores and protected riverbanks are not just wild areas or bucolic picnic spots. They are part of a



layered regional landscape in which cities cannot be disentangled from their water and woods, a landscape that teaches us that protecting natural systems and building better cities are part of the same project, though there is still much work to be done – both by historians and by those actively involved in shaping policy. Attention to connections between forests and cities that water supplies make abundantly clear can help guide that work.

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- [6] “An Evening of Entertainment: Miss Dock Addressed the Clio Club,” *Williamsport, Pa. Gazette*, 29 April 1899, clipping, Box 4, Folder 34, Mira Dock Collection (Manuscript Group 43), Pennsylvania State Archives, hereafter referred to as MDC.
- [7] For more on women and the City Beautiful Movement, see chapter two of Alison Isenberg, *Downtown America: A History of the Place and the People Who Made It* (Chicago: University of Chicago Press, 2004), 13-41: “City Beautiful or Beautiful Mess? The Gendered Origins of a Civic Ideal.”



- [8] Unidentified newspaper clipping from Richmond Virginia, 20 March 1898; "Village Improvement: Beautiful Surroundings Help to Make Beautiful Minds," *Evening Star* (Ridgeway, PA), 21 February 1899; and "Town Improvements: Miss Dock's Lecture, Giving Valuable Hints," *Wilkes-Barre Record* (Wilkes-Barre PA), 18 April 1901, all from Box 4, Folder 34, MDC.
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- [10] *Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania for the Year Ending November 30, 1904* (Harrisburg: Wm. Stanley Ray, State Printer of Pennsylvania, 1905), B326-B327.
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## A propos de l'auteur

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