

Stem to Stern Detailed Background and Research

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Forests and waterways may seem basic aspects of geography but they are also rich natural resources that have remained key throughout the history of New York and Vermont. They form the foundation for a diverse natural system that has long been a practical and spiritual hallmark of the region. Many ways of life over the centuries have revolved around these resources. The goal of this initiative is to appreciate the bonds between forests, waters, and human activity that rely on the natural environment.

The Ancestral Forests and Waters

Vermont and New York contain a diverse array of forest environments, from high mountain conifer forests to low oak clay-plain groves. Across these forests, in different amounts, grow hemlocks, oaks, pines, maples, beeches, birches, and ash, of many varieties.¹ It is estimated that as much as ninety-five percent of the land in what is now New York State and Vermont was originally covered by forest.²

This landscape is also characterized by numerous waterways running out of mountains. Thick forests of roots hold soil and retain rain as it falls on the landscape, regulating the numerous small mountain streams. These in turn feed larger creeks and rivers, ultimately supplying water for major water bodies of the U.S. and Canada, like Lake Champlain, the Hudson and St. Lawrence Rivers and the eastern Great Lakes.

Vermont and New York are home to two of the most celebrated American tree species: the white oak (*Quercus alba*) and white pine (*Pinus strobus*). These species have been extremely important for ecological and economic reasons.

The eastern white oak, one of the mightiest of the oaks, is an essential species in the eastern forests. It grows slowly and extends its branches over a huge area and its roots grow very deep if given time and space. Many species of animals and insects make a habitat within the great spread of a white oak, relying on its acorns, leaves, or the shelter of its bark and branches. Although it is difficult to know exactly, research indicates that in southern New England and New York, white oaks were a dominant species before the eighteenth century. They may have made up as much as 36% of forest species in some areas. It takes hundreds of years for a white oak to mature and, due to decades of extensive cutting, mature white oaks are now much more difficult to find. The composition of lowland forests has changed entirely, as red maples and other faster growing species now dominate.³

¹ Johnson, Charles W. *The Nature of Vermont: introduction and guide to a New England environment*. UPNE, 1998.

² Canham, Hugh O. *Milk Cans and Forests: Events That Have Shaped New York's Forests During The Last 300 Years*. Researching New York Conference SUNY Albany, November, 2012

³ Abrams, Marc D. "Where has all the White Oak Gone?" *Oxford University Press on behalf of the America Institute of Biological Sciences*, 53.10 (2003): 927-939

At higher elevations, another tree has long been dominant. The white pine, a great symbol of the American continent, used to dominate the northern forests. It was said that a squirrel could travel its entire lifetime without leaving the vast pine forest. Capable of growing hundreds of feet tall, extremely straight and thick, in the age of sail white pines were highly valued for ships masts. Later, in decades of mass cutting, white pine was cheap to transport and produced millions of board-feet of high quality wood. Naturalist and author Donald Peattie wrote that “In the three hundred years of its exploitation, White Pine, more than any other tree in the country, built this nation, literally and figuratively.”⁴ The pine forests of today are a much more mixed family of trees, with spruce, hemlock, birch and jack pine growing alongside the more recent generations of white pines. While white pines have regrown more successfully than oaks in New York and Vermont, very little of the original virgin forest remains.

Woods and Waterways in Use

The first residents of the region, Native American tribes including the Iroquois and Algonquin managed the forests to create habitat that supported the game animals they depended on. They also cleared forest for living spaces and agricultural activity and used the wood in countless ways, including for houses, tools, and watercraft. The forests not only provided pristine waterways and habitats for game and fish, but also supplied humans directly with important sources of food like acorns from oak species and the sugar from maple sap.⁵ The Native Americans were the first to travel the waterways of Vermont and New York on canoes hewn from tree trunks or made from the bark of birch trees. When Samuel de Champlain became the first European to venture down the lake that would bear his name, in 1609, he travelled amongst a fleet of these craft.

With the arrival of European people in North America, the forests became objects not only of subsistence but also of wealth and power. To early European settlers and governments, the wood these American forests provided was highly valuable. In particular, the white pine was essential for shipbuilding, as it grew tall, straight, and strong and in large numbers across the region. The rulers of England sent scouts throughout these early forests to brand the king’s sign (The Broad Arrow) into these pines, as raw materials for masts and spars reserved for the British navy. Also very important was the white oak, with its extremely strong, versatile wood and thick, expansive branches that made excellent curved ships’ knees.⁶

The value of the forest extended to more than just governments. For early white settlers to the region, the forest was the primary source of income and subsistence. The settlers’ way of life demanded that land be cleared for farming or grazing, and the wood

⁴ Peattie, p.11

⁵ Alberti, Andrew and Anita Deming. *From Forest to Fields: A History of Agriculture in New York's Champlain Valley*. Cornell Cooperative Extension, 2010.

⁶ Peattie, Donald Culross. *A natural history of trees of eastern and central North America*. Houghton Mifflin Harcourt, 1948.

from those cleared homesteads gave settlers an important source of initial income through the production of potash. By burning wood, soaking the ashes and finally filtering and heating the residue, pioneers could produce this alkali material.⁷ It was easily made and used locally for making soap, and was in high demand in Europe for use in the textile industry.⁸ Export of potash from America became a major early industry for the United States, and its production centered around frontier regions like Vermont and western New York in the late eighteenth and early nineteenth centuries.⁹ Potash and pearl ash (a more refined type of potash) was shipped north by boat to the Saint Lawrence and on to Europe, where it was used to make the soap needed in the production of cloth.¹⁰ The first patent for potash making technology was issued in Burlington VT in 1791.¹¹ That same year, the state of Vermont exported two million pounds of potash.¹² Land that was cleared could then be put to use by settlers as farmland or pastures and the money gained from potash production was used for initial payment on the land.¹³

Charcoal was also a key commodity produced through the burning of wood. As local iron-making industries became more common throughout the 1800s, the demand for Charcoal increased. Teams of wood-cutters were hired to produce it for local forges, which preferred the heat produced by charcoal fuel over coke (made from coal).¹⁴ Large amounts of wood continued to be cut for charcoal production until the late 1800s, with the fuel shipped far and wide along the waterways.

⁷ McGovern Pat. "Out of the Ashes: A Brief Local History of Potash and Pearlash" in *Local Banquet*, Spring 2012 pp.8-9

⁸ Rolando, Victor R. *200 Years of Soot and Sweat: The History and Archeology of Vermont's Iron, Charcoal, and Lime Industries*. Vermont Historical Society, 1992.

⁹ Wright, Leigh. *Potash and Pine: The Formative Years in Randolph History*. The Randolph Historical Society and The Randolph Bicentennial Committee, 1977. p.52

¹⁰ Williams, Michael. *Americans and their forests: a historical geography*. Cambridge University Press, 1992. p.139 "In 1822 Gov. De Witt Clinton of New York declared potash and wheat the two leading exports of the state. With such prices farmers produced as much as possible while they cleared and either purchased necessary supplies or bought their land with the income." "By 1845 the center of [potash] production shifted even farther west into Ohio." With the discovery of potash and salts in mineral water and later deposits, there was a decline in demand. "The cleared forest was now burned on the spot without even the thought or prospect of saving its stored minerals" p140 graph shows highest potash producing counties in north and western NY and in southern VT, 1840.

¹¹ Hill, Ralph Nading. *Lake Champlain: Key to Liberty*. Ralph Nading Hill to the Shelburne Museum, 1976. p.163

¹² Fisher, Dorthy Canfield. *Vermont Tradition: The Biography of an Outlook on Life*. Boston, Little, Brown & Co., 1953. p164, from Rolando. *200 Years of Soot and Sweat*, 1992. p37.

¹³ Sheriff, Carol. *The Artificial River: The Erie Canal and the Paradox of Progress, 1817-1862*. Hill & Wang, 1996. p.88

¹⁴ Williams, p.147 "The demand for iron in preindustrial America was for a malleable, wrought material, one best produced by charcoal." "Charcoal was still used in preference to coke; the iron was still beaten with hammers to remove carbon rather than being made by the puddling process in reverberatory furnaces, which allowed an impure fuel like coke to be used, and the iron was still beaten into shape rather than passed through grooved rollers to produce bars and rods." Williams cites 8 tons of wood to produce two tons of charcoal in order to smelt one ton of pig iron. Charcoal is 2.6 times more bulky than coke, thus more expensive to transport.

Another industry that relied on the forests was the tanning of leather. The bark of hemlock trees was a key ingredient in the tanning process. Particularly during the Civil War, when the military demand for boots and gloves skyrocketed, the tanning industry moved north to the foothills of the Adirondacks and Catskills. Hemlocks were stripped of their bark and left to rot on the ground, hemlock wood being considered of low quality.¹⁵

Above all else, though, lumber was the most important product that was supplied by these forests. Early American society relied on its abundant wood, for all kinds of uses. As the nation developed and populations increased, more and more wood was needed. Loads of lumber were siphoned west as new wooden towns sprung up overnight along the canals. Of 54,000 houses built in the year 1839, 84% were of wood.¹⁶ In his book about western settlement from 1836, James Hall wrote “Well may ours be called a *wooden country*; not merely from the extent of its forests, but because in common use wood has been substituted for a number of the most necessary and common articles – such as stone, iron, and even leather.”¹⁷ Such was the availability of wood that it was practically ubiquitous as a building and crafting material.

Before 1824, nearly all lumber mills were within six miles of navigable waterways.¹⁸ Logs could easily be moved from cut areas within nearby forests down streams or small rivers to the mills and on to larger bodies of water where they could be lashed into rafts and moved either north along Lake Champlain to Canada or down the Hudson River. If the wood was not used locally, it was transported to other markets along natural waterways. The difficulty of moving heavy logs overland on poorly maintained trails prevented trade between watershed areas.

After the canals were completed in 1825, previously separate watersheds were connected. Lumber in increasingly large amounts was loaded onto canal boats for transport south via lake and canal to Albany and on to New York City, where demand for wood was huge. The canals also opened access to new areas of forest across the region, and new streams down which logs could be sent to newly built mills. This pattern continued deeper into the mountains as more human-made waterways were completed.

Boats on the Water

The waterways of the region had always been extremely important routes of travel, for native peoples as well as later Europeans. Trade networks followed the lakes and rivers as goods were much more easily transported by boat than by crude road or trail.¹⁹ Thus, by

¹⁵ Canham, Hugh O. *Milk Cans and Forests: Events That Have Shaped New York's Forests During The Last 300 Years*. Researching New York Conference SUNY Albany, November, 2012. p.2

¹⁶ Williams, p.147

¹⁷ Hall, James. *Statistics of the West, at the Close of the Year 1836*. J. A. James and Co., Cincinnati, 1836. p.101

¹⁸ Williams, p.97.

¹⁹ Cohn, Arthur & Duncan Hay & Craig Williams. *The Grand Canal Journey: A Voyage through New York's Canal System with the Lois McClure 2007*. Lake Champlain Maritime Museum, 2007. p.2

the time larger commodities were being moved through the region, the local forests were essential to transportation by boat. In 1609, the same year that S. de Champlain traveled by canoe along with a group of Algonquin allies on Lake Champlain, explorer Henry Hudson sailed up a large river to the south that would later be named after him. Prior to the nineteenth century, the waterways were home to thousands of small sailing craft and rowed boats, with a much smaller number of large sailboats. Thousands of the bateaux-style rowed boats were built in the colonial period and used to move people and supplies.

The numerous fast-moving streams and rivers powered early mills in Vermont and New York. Wood could be obtained, milled, and used for boat building all within close proximity to Lake Champlain or other regional waterways. The availability of excellent wood allowed entire fleets of sailing ships to be constructed at baffling speeds on Lake Champlain. French, English, Colonial Americans and native peoples all constructed fleets of ships to challenge each other between the 18th and early 19th centuries, before fighting in the region finally ceased after the War of 1812. Plentiful tall pines supplied necessary spars and masts for sailing ships of all sizes. With the end of international conflicts, boats that had not been sunk were repurposed as trading vessels for the rapidly growing trade network.

During the era of canals, new types of boat designs emerged. Small shipyards could be found in communities all along the canal systems producing long, blunt-bowed canal boats to transport goods.²⁰ Huge numbers of boats were built for trade on the canals. In the town of Ticonderoga, New York, alone, fourteen new boats were launched in the year 1846, with an average of twelve more per year for the next decade. In the first year after its opening, the Champlain Canal saw more than 19,000 canal boats pass through.²¹ In the major port of Albany, 16,834 boats passed through in 1834, or about seventy per day.²² By the 1880s and 1890s there were more than four hundred boats operating on Lake Champlain alone, plus hundreds more large Canadian vessels.²³ In general, these long, low boats were towed along the canals by mules or horses, but some Lake Champlain canal boats maintained the earlier sailing tradition by keeping masts and sails which could be lowered upon entry into the canal. The Lake Champlain Maritime Museum's vessel *Lois McClure* is a replica of this type. Their ability to sail gave them an advantage over the towed boats that were relegated only to the canals. This advantage remained until predominance of steam and diesel tugboats, which could move long trains of canal boats over the lake.

The worlds of the boatman and the forester were often closely related. A famous case is that of Solomon Northrup, a free black man born near Albany NY, who worked on the canal as well as in the lumber industry. He recorded in his memoirs a winter spent

²⁰ Bellico, Russell R. *Sail and Steam in the Mountains: A Maritime and Military History of Lake George and Lake Champlain*. Purple Mountain Press, 1992. p.239. "In 1862 the state of New York legislated rounded bows for canal boats since accidents had increased significantly. When a squared-bowed canal boat collided with another vessel, it could sheer off the whole side of the boat, spilling its contents into the canal."

²¹ Larkin, F. Daniel. *A Short History of New York State Canals*. Purple Mountain Press, 1998. p.48

²² Larkin, p.39

²³ Bellico, p.147

working on the banks of the Champlain Canal, giving him the necessary funds to later purchase a pair of horses and enter into contracts moving timber on the canals. He was also known as a brilliant violin player and traveled all along the inland waterways of New York, Vermont and even Canada before he was illegally kidnapped into slavery and taken south. He was eventually rescued and went on to recount his ordeal in the book *Twelve Years A Slave*, once he had returned to a free life along the northern waterways.²⁴

The size of canal boats was dictated by the size of the canal locks in use at the time. The first boats were typically 77 to 80 feet long and 13 and a half feet wide. After 1860, when some canals were enlarged, boats became wider by a foot and up to 88 feet long. Many types of wood were used for the construction of these boats. Certain design elements, like a rounded bow, were eventually made into law to avoid some of the many possible accidents associated with canal work. All boats shared some common necessary characteristics, like centerboards and shallow keels, but often in the early days the designs varied slightly from place to place.

As the size of the canals expanded, so did the dimensions of many canal boats. The sailing canal boat *Lois McClure* is based on some of these later designs from the 1860s. Her decks are of white pine, while masts, booms and gaffs are hewn from white spruce. In total, she has more than 20,000 feet of wood from white oaks and white pines, all sustainably harvested in the eastern United States.

Great Changes

With the completion of the Erie Canal and widespread clearing of the forests, wheat quickly became a major export from western New York, in amounts that lowered food prices as far away as Europe. Wheat was so much in demand that farmers would clear trees and plant wheat around the stumps rather than spend time removing them. Genesee County quickly became famous as one of the largest flour producing regions in the world by 1838, barely more than a decade after the completion of the canal.²⁵ The census of 1840 indicates that the contiguous Genesee, Monroe, and Livingston counties each produced more wheat than any other county in the nation in the preceding year.²⁶ A historian writing about the Canal's centennial in 1928, gushed "the lumber of the country found a ready market and floated away. Wheat was worth four times as much as the price for which it had been previously selling. Prosperity came in on every hand; the mud dried up and the mosquitoes and the ague, and the fever, and the bears left the county." The state was quickly becoming "civilized" by the definition of the day. Areas that had been forested since the last ice age were transformed into farm fields, particularly in western New York and

²⁴ Northup, Solomon. *Twelve Years a Slave: With the Original Illustrations, Narrative of Solomon Northrup, a Citizen of New York, Kidnapped in Washington City in 1841, and Rescued in 1853*. Derby, Orton and Mulligan, 1853.

²⁵ Whitford, Noble E. "Effects of the Erie Canal on New York History." *The Quarterly Journal of the New York State Historical Association* 7.2 (1926): p.91

²⁶ Genesee county with 911,596 bushels, Livingston with 823,050 bushels, and Monroe with 1,074,813 bushels that year, in the *Compendium of the Sixth Census of the United States, 1840*. According to this research no other counties in the nation reached exports above 800,000 bushels.

Vermont. Clearing continued to outpace farmland abandonment until the end of the nineteenth century, when some forests began to regrow.²⁷ By the 1890s, up to 85% of the land in New York was being used for agricultural purposes.²⁸

The new ease of transportation turned the region into a lumber-producing machine. Vast tracts of forest were suddenly much more accessible and could be quickly harvested and sent down the canals. By 1839, a third of the lumber for the entire country came from New York State.²⁹ Albany, at the intersection of the Erie and Champlain Canals and the Hudson River, became the lumber capital of the nation, moving more lumber than any other city in 1865. Other lumber ports like Burlington VT and Buffalo NY, which sent and received lumber and supplies from the western Great Lakes and Canada, also expanded at incredible rates. Wood came down from the streams of the Adirondacks and Vermont, and west along the Erie Canal, all headed for the markets of New York City. Spurred on by the easy water access to forests and resources upstate, New York City grew at an incredible rate, quickly outpacing all other eastern cities in the U.S as the center for trade and industry.

The forests were harvested so quickly that by the middle of the 1800s, the price of wood began to increase as the most easily accessible forests were cleared.³⁰ The size of the original Erie Canal was quickly increased to accommodate unexpectedly high traffic, and plans for extended feeder canals (or lateral canals as they were called) were enacted to reach other corners of the state and to supply the main canals with adequate water.³¹ The Chenango, Chemung, and Genesee canals climbed onto the Allegheny Plateau and connected the Erie to major rivers in the south and west. North of Rome NY, the Black River Canal skirted the western Adirondacks and accessed the rich forests there. Lumber made up ninety percent of tonnage on that canal in its early days.³² Overall, these lateral canals were expensive, difficult to build, and most never made a profit, but they succeeded in allowing access to tracts of prime forest for loggers.

The original old-growth forests were scarce by the middle of the 1800s. In Warren County New York, the industry of cutting virgin timber, which had boomed in 1820, had entirely disappeared by 1860. The secondary growth that replaced the original forests was known to be of inferior quality and of different composition. In turn, the lumber industry in the later half of the century shifted to the production of spruce-fir pulpwood, which still relied on plentiful supplies of fresh water from the Adirondacks. Pulpwood was used in the early paper industry, along with processed “acid-wood” products like lye, tar, and

²⁷ Canham, *Milk Cans and Forests*, p.2

²⁸ New York Department of Environmental Conservation Report, “Natural History of New York” PDF.
http://www.dec.ny.gov/docs/wildlife_pdf/nathist.pdf

²⁹ Rutkow, Eric. *American canopy: trees, forests, and the making of a nation*. Simon and Schuster, 2012. p.108

³⁰ Wright, Leigh. *Potash and Pine: The Formative Years in Randolph History*. The Randolph Historical Society and The Randolph Bicentennial Committee, 1977. p.53

³¹ Larkin, p.42

³² <http://www.blackrivercanalmuseum.com/CanalHistory.htm>

turpentine. The forest service, as late as 1920, would report that 62% of forested area was suitable only “for fuel and acid wood.”³³

Throughout this regional shift to different wood products, demand for lumber in the northeast was still very high. The opening of the Chambly Canal in 1843, connecting Quebec to Lake Champlain, allowed large amounts of Canadian lumber to make its way south. Despite being one of the highest lumber producing regions in North America, imports from Canada and the western states were still necessary to satisfy demand along the Hudson River. Burlington VT boomed during this time, sending Canadian lumber south along the waterways and to other eastern cities by rail. At the height of the boom in 1868, Lake Champlain was home to a fleet of 1,021 canal boats and steamers and more than 3000 sailors.³⁴

Looking back, it is difficult to grasp the scale at which forests were cut in the nineteenth century. The canals facilitated such an efficient and universal harvesting of timber that forests seemed to disappear in the blink of an eye. No state or federal entities existed to record the conditions of the environment. Despite this, it is estimated that during the peak years for the lumber industry in New York, around 1870, some 1.3 billion board feet of lumber were cut, with some wood coming from the wider region.³⁵ Converted to distance, the board feet produced that single year would extend nearly ten times around the earth (or about the average distance from Earth to the moon).³⁶ New York State cut approximately 22.3 billion board feet in the twenty years between 1850 and 1870. Board feet being a measure of volume, in gallons this would fill the original Erie Canal more than six times over.³⁷ By 1900, it is estimated that only 6 million of the region’s original 29 million acres were forested. Ninety five percent of the region had been logged at least once, leaving only small patches of untouched forest high in the Adirondacks.³⁸ Including the forests of Vermont, that totals nearly 39 million acres of forest cut, many logged multiple times over the decades.

Beginnings of Conservation

³³ Canham, Hugh O. and George R. Armstrong. Long-term trends in New York State's Timber Industries and their Implications. State University College of Forestry, Dec 1968. p.19

³⁴ Hill, Ralph Nading. Lake Champlain: Key to Liberty. Ralph Nading Hill to the Shelburne Museum, 1976. p.233

³⁵ Hochschild, Harold K. *Lumberjacks and Rivermen in the Central Adirondacks, 1850-1950*. Adirondack Museum, 1962. p.67

³⁶ 246,212 miles (converted from 1.3 bill ft) divided by 25,000 miles (approximate distance around earth). The moon on average is 238,855 miles away. Estimates for board feet cut are from *Lumber production in the United States 1799-1946*, compiled by H. B. Speer, 1948 (U.S. Dept. of Agriculture, Misc, publication No. 669). Censuses prior to 1869 only supply product value, so earlier quantities were computed on basis of price per 1000 board feet, by Hochschild in *Lumberjacks and Rivermen*, p.67

³⁷ 13,926,233,825 gallons (converted from 22.340 mill board feet) divided by 2,286,046,753 gallons in Original Erie Canal (40ft x 4ft x 305,600,000ft)

³⁸ Canham, Hugh O. Milk Cans and Forests: Events That Have Shaped New York's Forests During The Last 300 Years. Researching New York Conference SUNY Albany, November, 2012. p.2

By the later half of the nineteenth century, the massive alteration of the landscape and its effects could not remain ignored. A number of prominent intellectuals of the period, witnessing the changes created in only a couple of generations, began drawing attention to what they saw. Famed American diplomat and Vermont native George Perkins Marsh, one of the first to write about the wide-scale human impacts on the land, published a book in 1864 called *Man and Nature*. In it, he claimed that by clearing a landscape of trees, people were unwittingly altering the wider ecosystem. He warned of lasting damage to the land by allowing the soil to dry up and wash away, an idea that went against the current of American culture, but that laid the groundwork for the future conservation movement.³⁹

As the decades went by, the effects Marsh had warned of become even more obvious. Farmers noticed diminished soil quality. Unpredictable floods increased across New York State. Droughts and forest fires also become more frequent. Recognizing this threat in 1870, an Adirondack surveyor named Verplank Colvin submitted a report to the state legislature stating: “The interests of commerce and navigation demand that these forests should be preserved, and for posterity should be set aside... Without a steady, constant supply of water from these streams of the wilderness, our canals would be dry, and a great portion of the grain and other products of the western part of the State would be unable to find cheap transportation to the markets of the Hudson River valley.”⁴⁰ The canal system, which had allowed the great movement of lumber, was now itself under threat. Canals rely on consistent amounts of water, and unpredictable runoff from the mountains failed to ensure adequate water levels in some places. The dramatic changes led many early writers to believe that forests regulated the entire climate, and cutting them would decrease rainfall.⁴¹ Though that theory was oversimplified, the threats of forest cutting to human and natural systems were becoming widely accepted.

With concerns mounting, another committee headed by the respected forester Charles Sprague Sargent was assembled in the 1880s to assess what could be done. Their survey recommended intensive state management of the Adirondack forests and decreased incentives for industry to log in the mountains. Despite the political difficulties of this idea, in May 1885 the New York State legislature passed a measure into law that created a “Forest Preserve” of all state land in the Adirondack and Catskill mountains, to be managed by the state and kept “forever wild.”⁴² The famous text reads: “The Lands of the State [of New York], 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

³⁹ Rutkow, Eric. *American canopy: trees, forests, and the making of a nation*. Simon and Schuster, 2012. p.95

⁴⁰ Rutnow, p.139

⁴¹ Williams, Michael. *Americans and their forests: a historical geography*. Cambridge University Press, 1992. P.144-145 for previous scholars on climate, 145 for following quote

Williams writes of Marsh “Here were the first stirrings of environmental awareness and the conservation movement, as it became known in the Western world. It started in America, and it started in the forest.” Marsh inspired by Alexander Von Humboldt’s observations of deforestation effects in S. America, 1790s?

⁴² Rutnow, p.142

be sold, removed, or destroyed.”⁴³ While many obstacles remained, it was the first state effort to conserve forest and water ecosystems for the good of the people and the environment.

Forests Today

These early efforts to protect forests represented an acceptance that humans and the environment are not separate entities. In the two hundred years since the canal system first tied the region together, the residents of New York and Vermont have witnessed numerous changes and adapted to deal with them.

Forests are now carefully managed across the region. State and national organizations exist to study and monitor conditions within the forests. Such was the extent of cutting in previous centuries that only now, after a century of forestry research, are we beginning to perceive a more complete picture of human impacts on the environment. Centers of environmental learning have emerged in cities born of the canals, like Syracuse, Ithaca, and Burlington. We have now come to realize that our activity effects even the microorganisms that inhabit the soil: living things that were nearly unknown until recently.

The New York Department of Environmental Conservation, created out of the many previous state conservation commissions, today manages nearly four million acres of state and private lands that have been set aside for conservation. The Adirondack Park, with its legacy of wilderness, remains one of the largest tracts of forest in the lower forty-eight states. It includes six million acres of public and private forest, more than ten thousands lakes, and thirty thousand miles of rivers. It also attracts millions of tourists seeking natural recreation and remains an icon of environmental stewardship. Vermont’s Green Mountain National Forest also protects nearly four hundred thousand acres of forest along the length of the state. Many mountain streams that feed Lake Champlain and the Connecticut River emerge from these protected forests.

Attention has been given to the many waters of the Northeast as well. Large-scale efforts to clean waterways like the Hudson and Lake Champlain have made progress but still continue. The New York Canal Corporation regulates the water levels of the canals. To do that, they must maintain careful cooperation with many other organizations such as the Army Corps of Engineers, the New York DEC, and the foresters who mindfully make a living in the State’s forests. Eighty percent of residents in upstate New York still live within twenty-five miles of the Erie Canal, and continue to benefit from its water. Thousands of boats travel the canal for recreation every year, and farmers throughout much of the state rely on it for irrigation.⁴⁴

The forests today have recovered significant areas of their original range. About sixty-four percent of New York is now forested again, along with seventy-five percent of

⁴³ New York State Constitution Article VII, Section 7, ratified in 1894.

⁴⁴ New York State Canal Corporation Report on Economic Benefits of Non-Tourism Use of the NYS Canal System. April 2014. <http://www.canals.ny.gov/economic-benefit-report.pdf>

Vermont. Better-managed hardwood forests have grown back and far surpassed pulpwood production in New York since the 1950s. But it is a new forest that covers the landscape today, composed of different types of trees. It is a young forest, often lacking mature, slow growing species like Oaks and very tall white pines. Maples and other pine species have come to dominate.

Many fragile environments still exist as well. In the agricultural section of western Vermont, the valley clay-plain forest, which was once a major home to white oaks in the state, remains quite rare. Likewise, many wetland forest environments in New York State are still under threat. Invasive species like the Zebra Mussel and arboreal diseases like the Chestnut Blight have swept through the forests and waters of the region, reminding us that the health of our environment still requires careful attention.

Although it is important to understand how ideas of conservation originated in the region a hundred and fifty years ago, stewardship among citizens today is what will keep our forests and waters healthy in the future. Lessons of the past have trained us to treat the land with respect and to remember that we do not live separately from the natural environment.