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Exploring Tensions Between Two Maine Landscapes: Toxic and Pristine

Presented to the Faculty of the Environmental Studies Department
Bates College

*In partial fulfillment of the requirements for the
Degree of Bachelor of Arts*

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Lewiston, Maine
May 2023

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Abstract

This thesis juxtaposes a historical account of environmental toxicity in Maine against the popular notion of Maine as a “Vacationland.” Maine is famous globally for its pristine aesthetics, iconic coastline, and vast wilderness. Because of this, tourism is amongst the largest economic sectors for Maine, much different from the complex industrial history that once drove the economy and built a strong foundation for the state. Public discourse advertises Maine as a “Vacationland,” capitalizing on its natural features while ignoring and even marginalizing the toxic history of Maine which is still impacting communities today. This idyllic visage of Maine contradicts the state's reality: the Industrial Era has left its mark on Maine in the form of environmental toxicity and pollution. The waste from mills has contributed to the PFAS crisis; PFAS, per-and-poly-fluoroalkyl substances, has contaminated hundreds of farmlands across Maine, deeming the farms to be polluted and useless. Drawing on the theories of William Cronan, Alexis Shotwell, and Rob Nixon, this thesis questions the validity of wilderness as truly pure and natural, thereby disputing Maine as a beautiful, untouched “Vacationland.” Public discourse illustrates Maine as an idyllic vacation destination, but this notion is a false pretense in that it ignores the reality of environmental contamination and the deleterious effects of industry in many Maine communities.

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Introduction

As an individual born and raised in Portland, Maine, I have grown up with Maine being referred to as a “vacationland.” To me, Maine culture consists of submerging myself in the freezing cold water, picking juicy strawberries, filling my hands with the sweetest blueberries, walking through big green forests alongside the flowing Presumpscot River, and skiing down my empty street after a snowstorm. Although I appreciate the beauty within the state, I have never fully understood its impact. In reality, “vacationland” means crowded streets populated by people en route to Acadia National Park, boat cruises filled with thousands of people, restaurant waits of fifteen minutes to two hours, and aggressive drivers who do not understand the notion of letting anyone cross the street or not cutting off drivers. While this dramatic flux of people during the summer months (also known as the only two months of the year most people would actually want to vacation in Maine) bothered a lot of people, it always instilled a sense of pride in me. My summer jobs in retail and waitressing enabled me to interact with tourists and answer endless questions about how I liked living in Maine or what to do while they were in the area. I have been genuinely proud, not only to live in Maine but also to confidently declare that I am *from* the state where tourists paid big bucks to visit.

The truth is that most tourists in Maine are looking to see - and find - only what they want to see, blatantly turning a blind eye to the parts of the state that are not pristine or problematic. To be fair, I, too, did not recognize some of these issues until I found myself confronted with them, specifically when I landed jobs outside of the tourist sector. In high school, I began working on a farm in southern Maine. This was my first authentic exposure to the working-class side of Maine. Although the farm was just twenty minutes outside Portland, the unfiltered, rural, rugged side of Maine became visible in a way for me to understand. While

the farm flourished in the summer months, it is not supported by tourists rushing through. Rather, it is dependent on the people in its local community. While the intensive labor career can be very rewarding, it is a massive responsibility and relies on endless hours of work. The work is physically exhausting, and farmers' efforts can be completely destroyed by drought, flood, or contamination in the water and soil.

This thesis will address my personal observations of the division and disconnect in Maine when describing Maine with words like pure and pristine. I will take an environmental history approach to analyze the economic and environmental impact of the mill industry, prevalent in the late 1800s. Mills, more commonly found in central regions of the state, negatively impacted the health and well-being of people living in and near mill towns and communities. Despite the health risks, for individuals living in these mill towns, there was an immense amount of pride.. Meanwhile, those not living in the mill towns, oblivious to the pollution and other consequences, benefited from the economic successes. After all, the mill industry was responsible for a huge economic sector of the state. Mills in Maine contributed to a network of important global export and trade.

Although mills were important to Maine's economy, they were major causes of environmental pollution, resulting in adverse impacts on human health. The industrial waste, created by the mills, contained chemicals now known as "PFAS," per-and-poly-fluoroalkyl substances, which were a tragic byproduct of many industrial processes, including mill manufacturing. The waste was brought to wastewater plants and turned into sludge which was then applied to fields, unknowingly infiltrating the soils and waters with horribly poisonous chemicals.

Maine's dependency on mills — and the PFAS crisis — both introduce a complex network of interconnected and independent toxic dilemmas. In addition to their examination from a historical perspective, this thesis also considers these issues from an environmental justice perspective with critical consideration about how some communities are disproportionately represented or impacted by environmental pollution across Maine. Research done by the Natural Resources Defense Council (NRDC) shows that access to clean, drinkable water in the United States is heavily correlated with sociodemographic characteristics such as race and socioeconomic status (Fedinick, 2020). Individuals in lower-income, marginalized communities are more likely to live closer to industrial plants which are indicators of pollution. Analyzing this research in the context of this thesis is pertinent since lower-income communities flood the central regions of Maine where mills were, and, to a lesser extent, still are, located.

While central regions are often neglected and wrought with poverty, coastal regions tend to attract people of much higher income. So, when tourist agencies advertise “Vacationland,” they are usually referring to the coastline as an idyllic destination worth visiting. Clearly, with the expansion of coastal communities, vacation homeowners, and summer visitors, Maine's socio-economic landscape is unbalanced. This thesis is divided into three primary chapters. The first chapter, “Background and Context,” provides readers with some broad theoretical frameworks helpful for understanding the remainder of the thesis. It also provides a brief overview of Maine's history as it pertains to both the mill and tourism industries - with references to their respective current situations. Chapter One serves as a robust introduction to the complex topics addressed throughout the remainder of the thesis.

Chapter Two presents a detailed historical analysis of the mill contamination. The late 18th century was a period of significant economic growth. Due to the potential observed in

natural resources, such as forest and water power by businessmen, entrepreneurs, and engineers, Maine quickly grew to be a primary powerhouse in the United States for textile industrialization. Because of this, many major rivers across the state were dammed for hydropower operations. While these were effective for the purpose they were built, they negatively altered watersheds by impeding the free flow of water and migration of fish. The change in water patterns, along with waste added to rivers by the industrial mills, caused a significant increase in water pollution, thereby harming ecosystems and bringing disease to already disadvantaged individuals.

Chapter three addresses the importance of agriculture to Maine's culture. A part of the attraction to Maine is the idea of being able to sustain oneself off of the land. PFAS, per-and-poly-fluoroalkyl substances, are making it increasingly difficult for this ideal to become a reality due to contaminants harming the soils and waters in which crops are grown and animals eat. PFAS are man-made chemicals used to make fluoropolymer coatings and products. They are used both for industrial and consumer purposes. PFAS resists heat, oil, grease, and water. The most common example of PFAS being applied to consumer products is on a raincoat, nonstick pan, Tupperware, or wax. In many industrial mills, they were used in the manufacturing process. In paper mills, PFAS was applied to the gloss of magazine covers or newspapers. The industrial waste was taken from the industries and brought to wastewater treatment plants. Solid sludge, a byproduct of the wastewater process, was applied to hundreds of farmlands across Maine in an attempt to recycle solids throughout systems. Wastewater and government facilities informed farmers in the 1970s and 1980s that the biosolid sludge was filled with beneficial nutrients which will serve as a productive fertilizer for their crops. While this is true to an extent, recent research has informed the public that the sludge was contaminated with high concentrations of PFAS. Now, farmlands that had sludge applied to them are coming back with positive test results for

PFAS, deeming the landscape toxic. PFAS in humans has many negative health impacts. They are known as *forever chemicals* because they do not easily break down in the environment. They move through soils and water easily, contaminating Maine's environment without any observable changes to the land. The contaminated sludge application also has polluted ecosystems. Some of the highest concentrations of PFAS found in Maine are in fish. The state has had to put limits on the amounts and locations of fish caught. Similarly, many wild animals hunted can no longer be eaten, impairing traditional sustainability practices on which many Mainers have prided themselves.

Mill pollution and PFAS contamination have desecrated the purity of Maine. The disconnect between the invisible, toxic landscape of Maine and the tourist-directed, "Vacationland" image of Maine creates an inexplicable tension between two valid narratives. Shifts in Maine's primary economic sectors reflect the contradictions. Although the industrial pollution in Maine does not significantly impact the image, it is harming vulnerable Maine communities. The majority of public discourse surrounding the state does not acknowledge the contradiction impacting local communities primarily because the tourist industry is reliant on guests coming to Maine to fulfill the ideal image which has been created.

Background and Context

The sign at the border of Maine says it all: “Welcome to Maine - the way life should be.” The sign serves as an effective advertising strategy because millions of tourists visit each year, and the influx of new residents seeking to move to the state has increased. Author Lowell Ruck questions whether the motto is too effective, considering cities in Maine have become new trendy living destinations for wealthy individuals seeking a nature-centered or simpler lifestyle (Ruck, 2019). Although this interest may benefit the Maine economy, it has also gentrified neighborhoods. Native Mainers, of working-class neighborhoods along the coast, have resorted to putting no trespassing signs on beaches that used to be community areas to keep unwanted guests out. Cities like Portland are increasing in popularity, subsequently rapidly changing the city and displacing individuals who have been residing there for long periods of time because of the significant increase in property value. A city that was once a low-profile, blue-collar seaport to a culinary and cultural destination. Since 2003, the median value of residential properties in Portland has increased by over 40% (Curry, 2020). By nature of realistic affordability, this gentrification process is displacing locals by superseding them with wealthier individuals able to buy property. Supposedly fueled in particular by the Covid-19 Pandemic, domestic and international migration to Maine has added over 20,000 people to the state’s total population just since 2020 (Dahl, 2022). These tensions have disrupted traditional ways of life, putting native Maine residents, who feel strong connections to the state, in opposition to newcomers, who have not yet established deep relationships.

This introduces the question of who really is a “Mainer”? Ruck expresses his dissatisfaction with residents falsely calling themselves Mainers when he says “Maine’s history and culture are built on deep ties to the land and the communities that emerged on it... You can’t

just buy this sort of connection, nor can you simply award it to yourself” (Ruck, 2019). Through this logic, he states that those who are true “Mainers” are the ones who are actively working with Maine’s physical landscape (Ruck, 2019). Mainers are fundamentally rooted in their communities, and therefore, many wealthier, newer residents fail to replicate this same connection (Ruck, 2019). Likewise, Richard White seconds this notion of belonging by arguing that “Work that has changed nature has simultaneously produced much of our knowledge of nature” (White, 1995). In his article, “Are You an Environmentalist or do You Work for a Living,” White addresses the tensions between modern environmentalists and blue-collared workers (White, 1995). He states that “Environmentalists have come to associate work - particularly heavy bodily labor, blue-collar work - with environmental degradation... Environmentalists usually imagine that when people who make things finish their day’s work, nature is the poorer for it” (White), and nature should be protected from those people. Although the climate consciousness of environmentalists is beneficial, their lines of work ironically create a disconnect between humans and nature. White generalizes that the work of environmentalists is not centered around physical labor, and therefore it is common for them to not think deeply about their work in relation to nature.

Native American peoples have inhabited the territory known as Maine for 12,000 years. Currently residing in Maine are people collectively known as the Wabanaki or “People from the Dawnland.” Within the Wabanaki people, the four tribes living in Maine are the Maliseet, Micmac, Passamaquoddy, and Penobscot. In past generations, the Wabanaki people would travel to the coast of current-day Mount Desert Island and Acadia National Park to hunt, fish, gather berries, harvest clams, and trade with other Wabanaki. Confrontations attempting to displace and erase the Wabanaki tribes began in the 1500s by European colonizers. Wabanaki people resisted

colonization to the best of their abilities, but the forces of the colonizers were too strong with their onslaught of guns, disease, and attempted genocide (*Wabanaki Heritage, Culture & Craft - Acadia National Park (U.S. National Park Service)*, n.d.). In spite of these obstacles, the Wabanaki remain resilient and persistent in pursuing their rights and advocating for their land.

Once a native homeland to the Wabanaki people, Acadia National Park is now the biggest tourist destination in the state of Maine. With over four million people entering the area every year, it is now one of the most-visited national parks in the United States (*Park Fact Sheet - Acadia National Park (U.S. National Park Service)*, n.d.). For the majority of the last century, the federal government prohibited the Wabanaki people from harvesting sweetgrass within the boundaries of Acadia National Park, a cultural tradition and way of life. Setting limitations on this practice along with many others serves as a significant form of oppression by removing a major part of the Wabanaki culture. In 2015, the National Park Service shifted regulations to allow the gathering of certain plants by Native American tribes that are federally recognized (*Wabanaki Heritage, Culture & Craft - Acadia National Park (U.S. National Park Service)*, n.d.). This change opened pathways for Indigenous people to renew cultural practices and rebuild relationships with their land.

Although Maine history cannot be told without acknowledging and understanding the complexities of Native American narratives as they relate to colonial histories, this research does not closely examine those dynamics. Without excusing the dire ramifications of oppression or displacement from colonialism, which is certainly relevant, this research revolves around public perceptions of Maine as related to a more recent wave of colonial history. Ancestral colonists saw the same potential in Maine that present-day tourists see for their pristine vacationland.

Toxicity from PFAS contamination does not know cultural, racial, or ethnic barriers. It impacts all living creatures.

Once Maine successfully defined its borders by separating from Massachusetts in 1820 and negotiating its northern boundaries with New Brunswick in 1842, it became the 23rd state to join the United States of America. A period of tremendous economic growth followed the emergence and successes of crucial mining and manufacturing industries. Lumbering complimented traditional fishing and shipbuilding vocations — as well as ice harvesting and the quarrying of granite and lime.

Other significant sources of industrial growth included water-powered industries in the early nineteenth century. In 1825, a long legacy of cotton production commenced when Saco Manufacturing built the largest textile mill in the country; it was located along the Saco River, dividing the towns of Biddeford and Saco. This industry expanded across Maine as more rivers were identified as having similarly, the immense potential to generate mill power. Textile mills brought families, employees, businesses, and the economy to the towns; however, they also brought pollution, disease, and inequality.

This trend continued as the Portland, Saco, and Portsmouth Railroad arrived in 1842, and soon after, seven different stagecoach lines also serviced the areas. This collaborative service made it convenient for workers to travel across Maine. In 1853, the railroad service expanded from Portland to Montreal. By the late 1860s, thousands of workers heard of the opportunities available in the Maine textile mills and consciously chose to leave Canada to pursue work in Maine. Many of the industrial communities employed French-Canadian immigrants.

In the 1900s, Maine's potential for industrialization came to fruition. Herbert K. Furbush advocated for this opportunity in front of the Joint Legislative Committee on Water Powers of

the Maine Legislature as he voiced his thoughts on how valuable natural resources could be both utilized and conserved (Judd, 1988). Once the powerful rivers were controlled, they could be transformed into industrial energy and benefit the countryside. Furbush believed this would fulfill “economic destinies” for Maine’s small towns and villages (Judd, 1988). The vision he had would ultimately transform the face of rural industry and the surrounding regions, providing jobs and destinations for developing companies to support growing populations. His vision, which began as a localized phenomenon, was ultimately rejected with a growing monopoly over water as a resource. While Furbush was proposing to take advantage of the natural resources Maine had to offer with a conservative approach, large and powerful corporations were actively looking to deplete these resources to make as much profit as possible (Judd, 1988). Throughout the nineteenth century, “Strategic resources were appropriated by large corporations, whose needs continued to dominate the state’s vision of proper land use throughout the nineteenth century” (Judd, 1988). This dynamic and rapidly growing business endeavor was supplemented by the competing interests of the tourism industry which emerged in the 1890s (Judd, 1988). From an economic standpoint, these two industries were identified as the best use of rural landscapes because the leaders saw that both could profit off the purely natural features of Maine’s rugged environment. Although individuals like Henry Furbush combatted this exploitation, Maine’s conservation efforts have often been minimalized for economic gain (Judd, 1988).

Beginning in the late nineteenth century and into the twentieth century, the Maine coast, in particular, became an attractive destination to which city folk from southern states retreated in their quest for serenity and desire for connection with nature. By 1897, *Nation* magazine reported that some form of a summer resort existed every mile along Maine’s coastline from Kittery to Mt. Desert Island. Between the years of 1887 and 1914, Maine gained over one thousand

exclusive hotels which flourished during the summer months (Judd, 1988). Maine was advertised as having healthy environments which served as refugees from the vexations of more industrialized cities. The influx of tourism offered new markets for produce, real estate, rural and niche craftsmanship, and new livelihoods for villages across the state that had been suffering from the collapse of agricultural bases in northern New England.

With the onslaught of incoming summer people, new stereotypes and narratives began to form, accentuating the differences between Maine, rural society, and the urban, northeast visitors who traveled to Maine for a break from their hectic city lives. Advertisements to visit the coastal towns of Maine touted a romantic, pre-industrial image that highlighted the “informality and charming anarchy of coastal village scenes” (Judd, 1988). People residing in these regions lived “like one large family or clan, with no aristocracy, no middle class, no poor” (Toner, 2008), and when travelers ventured inland, they could go to the lakes of Maine woods and “cast off the veneer of city life” (Toner, 2008). This tourist-centered landscape advanced business models and investments in the state. By contrasting the idyllic Maine landscape with the crowded, dirty industrial regions most vacationers were looking to flee, the narrative around tourism presented the state as a poetic conception of the beauty of the wilderness, unpolluted and untouched by progress existing elsewhere.

Maine Publicity Bureau’s campaign in 1990 asserted that “Maine means getting away from the rat race... [it is] a state where nature’s unspoiled bounties await [and where] scenic, rugged beauty offers a lifetime of cherished memories” (English and Tree, 2019). Painting Maine as this picturesque ideal was a master narrative directed toward visitors. It reconstructed the state as one intended solely as an escape from urbanization. This image of Maine contradicts narratives described by the majority of individuals who have resided in the state for multiple

generations. Its true history, rooted in low to middle-class socio-economic demographics, is actually home to the exploitation of natural resources, invisible toxicities, and harsh weather climates.

As Sanford Phibben iterates in his novel The People of Winter, “This Maine is frustrating; it is hard on people. It is a life of poverty, solitude, struggle, lowered aspirations, living on the edge” (Phibben, 1986). Although the socio-economic demographics of Maine range significantly in the twenty-first century, the state has a deep history of poverty. Even today, Maine is home to around 200,000 individuals whose lives consist of a daily struggle to hover above the official poverty line. They are so close to the “line that a cutback in work hours or a family illness sends them below” (Toner, 2008). For these residents, Maine's livelihood is far more rugged and brutal than it is gentle and restorative.

This thesis researches the toxicity that has secretly contaminated Maine landscapes. Although tourism has increased 29% since 2021, the tragically high rates of toxicity in the soil, water, and air across Maine are being uncovered daily. It is difficult for individuals to grasp the extent of the pollution when it can not be seen with the bare eye but rather shows up as chemicals drifting through the air breathed, circulating through the water systems, or infiltrating the soil that produces food. These are the types of toxicity that do not necessarily disrupt a landscape, but rather mysteriously show up in bodies with no direct link to a tangible circumstance to blame.

In Maine, this causes a significant disconnect between the tourists who travel from afar to experience the state's beauty and the residents who subsequently deal with the consequences of living in a state filled with the toxic repercussions of tourism. The term “slow violence,” coined by Rob Nixon, reflects the suffering and degradation inflicted upon communities and

environments by impersonal and dispersed forces. Slow violence spreads across a region slowly, oftentimes with no defined point of impact. It is continuous and gentle, yet it can be truly deadly. It is difficult to conceptualize the destruction of these circumstances because they are often not observed until the conditions have progressed to an extreme. Situations reflecting slow violence are known for not getting appropriate media attention because they may not be as interesting as their fast-paced counterparts.

When community members are invested in their health and well-being and remain determined to hold others accountable for others' contributions to toxicity, community members are more likely to increase research that would enact policy change. In her book, Mill Town: Reckoning With What Remains, Kerri Arsenault reflects on her time growing up in the rural working-class town of Mexico, Maine. Similar to many other small towns in Maine, Mexico revolved around a paper mill that employed the majority of the people of the town. The mill provided a strong source of income and community for the small town at the cost of environmental destruction and the decline of the town's economic, moral, and emotional health by way of a slow-moving disaster. Mexico, Maine eventually earned the sickening nickname, "Cancer Valley," reflecting the health consequences of the paper mill after a suspicious number of people died after battles with cancer. Although the employees working there were under no impression they were damaging their bodies, the chlorine paper-bleaching process produced dioxin, which is a generic name for a family of 75 related compounds; dioxin is a toxic chemical, also used in Agent Orange, which had flowed into the Androscoggin River, especially during the industrial era.

Agent Orange is a combination of herbicides that the United States military forces released in Vietnam from 1962 to 1976. Although the intentional use of Agent Orange ended in

the 1970s, the dioxin contaminant continues to have an extremely harmful impact on Vietnamese individuals and the land, today. During the Vietnam War, the military forces sprayed it at up to twenty times the concentration that was initially recommended for killing plants. It mutilated millions of acres of forests and farmlands, the majority of which continue to remain degraded and unproductive today. The chemical, dioxin, that exists in Agent Orange, is able to remain toxic in the soil for decades and will likely never fully escape the water systems of Vietnam. Exposure to Agent Orange has been identified as the cause of abnormally high incidences of miscarriages, skin diseases, cancers, birth defects, and congenital malformations. The toxin itself serves as slow violence — conquering both the human body and the environment

Arsenault's memoir calls into question *paper production* in general. Arsenault's personal anecdotes about the paper mill, often narrated by her father and grandfather, provide a crucial context for how the paper mill managers relied on the silence of the mill workers to generate successes while ignoring environmental damage or the illnesses moving through communities. Her grandfather, along with numerous others, died shortly after retiring from his mill job. Most of his cohort had worked in rooms where the paper pulp was bleached white. Employees had opted for silence rather than speaking up about environmental concerns or advocating for safety measures that might have protected their exposure to harsh and ultimately fatal toxins. Likely a choice related to maintaining their jobs and financial stability, laborers obeyed supervisors and abided by the "Don't say anything" demand; employees were regularly told to dump toxic waste from the mills into the town reservoir. Workers did not want to lose their jobs.

In her book, Arsenault asks the thought-provoking question: if all of our lives revolve "around the silences, we're afraid to violate?" (Arsenault, 2020), thus addressing the irony of toxic loyalty. Workers knew, on some conscious level, that what they were doing was blatantly

damaging the environment and potentially their loved ones, yet their commitments to their jobs outweighed any moral question. Even after individuals were becoming ill, Rumford citizens continued to live and work in a place that they knew could make them unwell, but they continued to stay loyal to their jobs with pride, ignoring any indication that they might get sick and believing the mill managers' persistent denials about the concern. Arsenault is confronted with mixed emotions in that she consistently reiterates the pride and love for the community that the Rumford people had. Though they held deep connections to the land, their labor-intensive mill jobs provided a strong sense of camaraderie and created a foundation for community among Rumford residents.

Kerri Arsenault's book attracted nationwide attention to the issue of pollution caused by the mills in Maine. Since then, the paper industry has declined, and tourism-related services have been dominant. Similar to the quandaries faced by Arsenault's father and his co-workers, some residents are having precarious conversations regarding the preservation of environmental quality and the potential for economic expansion, especially in the tourism industry. Across sources, media advertises Maine as being a state with few people and a majority forest, rocky Atlantic Coast with pristine frigid waters and an abundance of the fishery, charming small towns, stunning sunrises, and stunning green mountains. *National Geographic* publicizes the state as, quite literally, having all aspects of an outdoor adventure, making it the ideal space for an active tourist seeking a nature retreat to be (*Explore the Many Sides of Maine*, n.d.). The article fails to mention any problems Maine has experienced over the years, but instead, the reliable source encourages individuals from all over to travel to the state and trample on the untouched, prized possessions Maine has to offer. Although it is true that Maine is the most sparsely populated state east of the Mississippi River, the *National Geographic* advertisement, along with several others,

promotes Maine as a playground to be conquered. Ironically, Maine is actually an economically depressed state, and the rugged beauty and challenging climate hold entirely different meanings for many native Maine residents.

Tourism, fishing, forestry, mining, and agriculture comprise the second most valuable sector of Maine's economy. Thus, the Department of Agriculture is another area of interest for this research. Recent identifications regarding PFAS, poly-and perfluoroalkyl substances, on farmlands circle back to the invisibility of toxicity. In the 1990s, farms across the state of Maine were contaminated by the application of sludge and septage containing high concentrations of PFAS, poly-and perfluoroalkyl substances, which they were told would make an effective fertilizer adding nutrient value to their land (Ropeik, 2022). Sludge, a semi-solid waste generated from a wastewater treatment site, contains substances such as domestic, commercial, and industrial waste, food scraps, fats, soils, grease, soaps, and chemicals. Put simply, it may be composed of anything that goes down any drain. Wastewater sites treat the contaminated water in order to recycle it back into the environment. Ultimately, sludge is a byproduct of this process which then has been spread on agricultural land for decades as a supposed nutrient. Although the toxic chemical is not visible, its effects are long-lasting and detrimental to human health and the crops which are grown on the land. Although it is present in numerous other places and aspects of life beyond agriculture, this research will focus primarily on the invisibility of the harmful contamination, and think critically about how it impacts residents' alignment with landscapes.

Maine, the largest state in New England, is known for its abundance of agriculture primarily due to its excessive open space in relation to its population. For decades, it has been the regional leader in the percentage of wastewater solids recycled back to the land, exceeding 85% in the 1990s and 2000s (*Maine — National Biosolids Data Project*, n.d.). While this is

admirably efficient use of biosolids, in recent years this system has not continued due to the reduced availability of beneficial outlets and increased regulatory restrictions – largely due to the high quantities of PFAS found in recent soil and water samples collected by farmlands. In 2018, 35% of Maine biosolids were sent to landfills, and 40% were spread on land, an overall significant decrease. By 2020, the landfill was receiving around 76% of the wastewater produced in the state (*Maine — National Biosolids Data Project*, n.d.). The North East Biosolids and Residuals Association, also known as NEBRA, argues this is a tragic waste of potentially nutrient-rich wastewater solids. It is very expensive and contributes to extensive emissions in landfills. With this being said, the wastewater cannot successfully be returned to the land until scientists find an effective way to rid the wastewater of maximum PFAS.

Defend Our Health, a non-profit organization based in Portland, Maine, combats NEBRA's position by arguing that sending PFAS-contaminated sludge to a landfill is preferable to applying it randomly to farmlands. PFAS are extremely difficult to destroy due to the impressively strong chemical composition, and it is best if it is sent to a facility to be managed properly rather than allowing it to seep into the soils and waterways, thereby impacting communities.

Beyond agriculture, PFAS is impacting Maine's tourism primarily through hunting and fishing appeals. *The Bangor Daily News* reports that wildlife agencies have found elevated levels of PFAS in game animals such as deer, wild turkeys, and fish. This has prompted health advisories in places where hunting and fishing are both fundamental ways of life and key components to the Maine economy. Maine was among the first states to detect high concentrations of PFAS in deer, a game animal that tourists and locals travel to hunt during the fall and early winter seasons (Whittle, 2022). The state issued a "do not eat" advisory last year

for deer harvested in the Fairfield region after several animals were confirmed to have had high levels of PFAS (Whittle, 2022). Similar to humans, it is likely the animals were poisoned with PFAS by ingesting contaminated food and water. PFAS has no apparent taste or smell, and therefore, no true way of knowing whether it exists within an area until tests have been conducted. Hunting has successfully mitigated the control of various species. When hunters cannot pursue their hobbies, ecosystem imbalances occur, presenting themselves in other ways, such as increased tick populations.

Maine's history can be analyzed in terms of the phases which correspond to the driving forces of the state's economy. Although the distinct boundaries of each period may be debated among historians, Lloyd C. Irland divides Maine's history into five periods depending on the economic activities and important trends. He refers to the first period, from the beginning of colonialism through about 1820, as the time of "Insecure Settlement and Early Growth" (Irland, 1989). During this time, Maine was composed of small subsistence communities and fishing stations which were the outposts of other economies. The second period is known as the "Extension of the 19th Century Agriculture, Industry, and Commerce," dating roughly from the year of Maine's statehood in 1820 to about 1880 (Irland, 1989). It was during this second period when mills and factories were conceptualized and built. Following that was the "Industrial Transition," or the third period according to Irland, when electricity and innovative technologies transformed the industrial landscape and, therefore, the economy (Irland, 1989). Previously established industries, such as textile mills and other labor-intensive factories, grew rapidly through the end of this century. That third period progressed from the 1880s until the Great Depression. Irland refers to the fourth period as "Social Stability and Industrial Change" during which the economic landscape was shaped by industries exploiting the cheap labor of

impoverished communities (Irland, 1989). This period ended during the 1974-75 recession. Lastly, the “Post 1975 Recovery” has brought the state into new economic territory with service industries that introduced new tiers of prosperity along with unfamiliar economic, environmental, and political problems. With this framework of *time* in mind, this research will examine intersections between periods and will particularly consider how the historical mill and agricultural industries overlap with dire implications of invisible environmental toxicity.

The researchers’ issues of environmental toxicity are prevalent and powerful, but they primarily impact only the residents who live in the regions rather than populations who are able to leave. Not only does this question reflect inequity and lack of accessibility to resources, but it also creates tensions between residents and tourists in new, complicated ways. This thesis will analyze the invisible toxicity of Maine through the historical lens of the paper mill history, along with the more recent impact of PFAS invading our landscapes. Both aspects create tensions within the Maine economy which are valuable and crucial to understanding deeper disparities across the beautiful state.

Mill Contamination

Whereas one of Maine's cultural identities was influenced by occupations like lumbering, quarrying, and fishing, another of Maine's identities were formed during the Industrial Revolution when some of the largest textile factories flourished in New England (Irland, 1989). With the collaborative efforts of entrepreneurs, engineers, and investors from Massachusetts who provided capital for the mills, Maine became a primary powerhouse behind textile industrialization in the United States. Two years after the large textile mills in Lowell, Massachusetts were built in 1826, the Boston Manufacturing Company built a mill nearly twice the size at the Saco Falls; this was known as the Saco Manufacturing Company. By far the largest and most productive single cotton mill in the country, the Saco Manufacturing Company tragically caught on fire in 1830 and was rebuilt on a smaller scale.

This began the growth of the textile mill industry as it spread into *central* Maine, as the power of the Saco River was found to be comparable to the Androscoggin River in Lewiston. Due to the immense power of the Androscoggin Falls, Lewiston was destined to become Maine's largest textile center. In 1845, several local investors and entrepreneurs came together to create the Lewiston Falls Cotton Mill Company. They dammed the river, dug canals, and two years later sold their investment to Benjamin E. Bates who was a member of the Boston Associates. Bates opened a new mill in 1850 and another in 1854.

Before the Civil War began, Maine textile mills were dependent on young local farm girls. During the Civil War, Bates expanded again and sent agents out to recruit young women to work for the mills. The company offered pleasant boarding houses along Canal Street, which were clean, inexpensive, and strictly monitored. Similar to other textile centers, young women

continued to reside in these boarding houses and labored in the mills until the Irish immigrants replaced them.

Families immigrated to Maine from Ireland dating back to colonial times, but the potato famine of 1845-1851 triggered a dramatic influx in migration. Immigrants were impoverished and debilitated. They sought out cities with expanding industries because opportunities for financial stability and a better way of life existed. French Canadians faced a similar agriculture crisis in the mid-century and began a great migration to Maine in the 1870s, eager to move on from the uncertainties of farming in order to have the security of a weekly paycheck of hard work in the mills.

The system in place had entire families working. The men would labor digging canals, foundations, and railroad grades while the women and children were toiling in the textile mills. Immigrant families lived in segregated neighborhoods, typically on cheap land in close proximity to factories and warehouses. Crowding and sanitation problems brought devastating outbreaks of cholera and typhoid.

From 1880 to the Great Depression, major industrial transitions occurred. No longer was agriculture Maine's dominant sector. Maine followed New England's general decline in farming, and in general, a severe shift followed in the state's precious rural image (Irland, 1989). Barns that once flourished began to decay – ironically in the same manner that many of the mills are dilapidating today. Farms that did survive expanded in size and modernized by adopting new crops and animals to integrate themselves into regional markets. The shrinkage of historically traditional industries caused the mills to gain strength. Hydro dams, larger textile mills, paper mills, and major public works improvements introduced large amounts of capital that relied on partnerships outside of the state. The continuous influx of immigrants enabled states like

Massachusetts to continue to reap the benefits of Maine's industry with low labor costs and cheap power which degraded natural resources (Irland, 1989). By 1914, textile employment in the state reached around 22,000 workers of majority women. These growing mill towns continued to have large numbers of immigrants flooding the areas in search of employment and affordable housing.

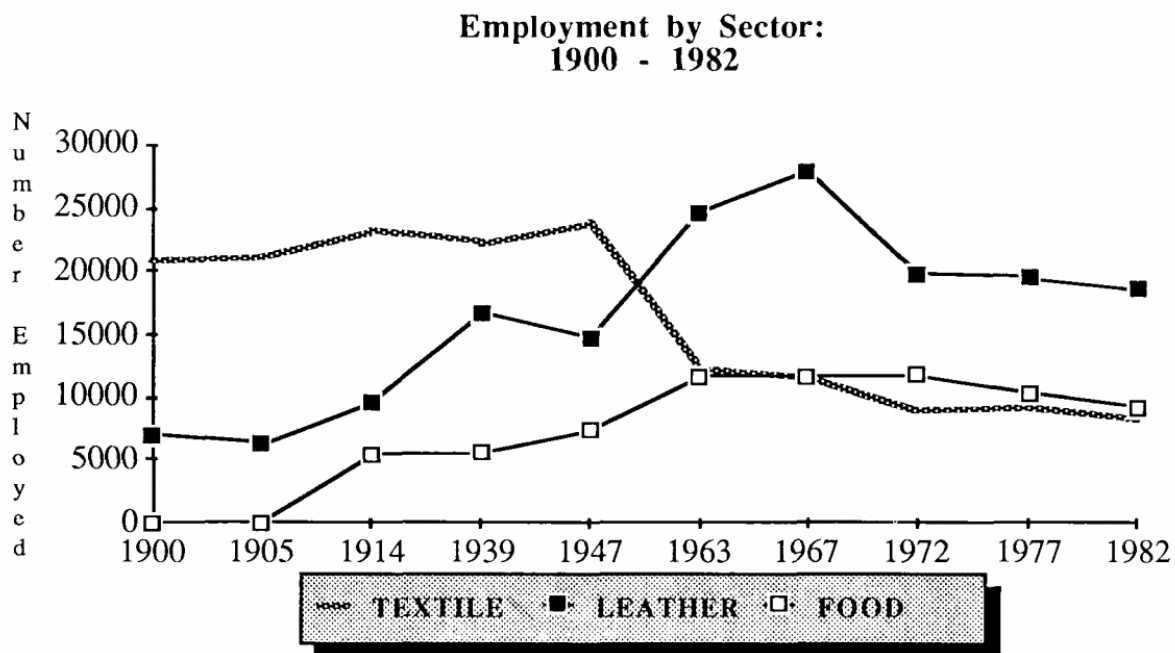


Figure 1. This figure shows variation in Maine's employment by the three dominating sectors textiles, leather, and food between 1900 and 1982 (Irland, 1989).

Beginning in the late 1890s, electric power generation evolved to be the new force altering Maine's rivers through existing dam sites. This reshaped many of Maine's natural landscapes while aiding the transition from hydro-mechanical power, which still remained important, to electric power generation (Irland, 1989). Although at this point in time, the paper had been long manufactured in smaller plants in Maine, the new technology of electricity

expanded the potential of wood-based papermaking technologies which had been developed in Europe in the 1870s (Irland, 1989). Industrialists continued to build new paper industries, particularly in small towns, at the site of dams and opportunities to secure abundant supplies of cheap wood. These powerful industries were embodied in massive, brick buildings that stood proudly beside major rivers in small towns.

The growing paper industry caused new supplier industries, such as limestone quarries and specialized construction and metalworking firms, along with supplying new customers for the railroads. By the end of World War I, a new economy of Maine had been fully built and the reduction of 19th-century farming seemed permanent in the past (Irland, 1989). Although this was a booming industry for the period, the apex of these industries would soon prove to be temporary. Out-of-state ownership and capital remained important, but the industrial transition of this era shifted Maine's market focus from a worldwide scene to a more insular domestic one (Irland, 1989). Towards the end of Maine's peak mill era, Maine continued to depend heavily on manufacturing, a phenomenon which continues to prove true today.

Although pulp and paper mills remain integral components of the New England landscape, their tall, polluting smokestacks – with hissing steam vents, loud construction equipment, rancid sulfur stench, and tall brick walls hiding the inside – create a mysterious and disturbing image. David Nye, in *American Technological Sublime*, analyzes systems of modern industrial technology that elicit reactions of wonder, awe, and terror as prompted by nature. Maine regions composed of papermakers, community members, and tourists all gathered to observe the unprecedented size, volume, and speeds of water volume required to complete the mass paper production that occurred. River Valley, in Rumford, Maine, was home to the Oxford Paper Company. Constructed in 1901 by industrialist Hugh J. Chisholm, the River Valley

landscape continued to impress and serve as a source of pride for all aspects of the community. Aaron Cayer, in his essay, “Mill Supply: Making Paper and Maintaining the Technological Sublime,” reveals that the technological sublime has maintained and reproduced itself through the tangible and powerful experience of the workers in these paper mills, rather than merely through the production of paper. He does this by arguing that since the beginning of the industrial era when the influence of mills began, Maine and other mill-driven states continued to gloss over the mill process by “looking past and denying views of the textured and pungent wood that f[ed] the mill, as well as the health and wellbeing of the worn-down papermakers who offer[ed] their labor and, in many cases, their lives” (Cayer, 2021). His essay serves as a case study of River Valley in particular. However, this tragic story is one which can be applied to several Maine mill towns.

Similar to other New England mill towns, the paper industry transformed Rumford entirely from an agricultural community to a pastoral industrial center. Rumford was chosen to be a mill town due to the seemingly limitless supply of natural resources beneficial for the production of paper. Loggers were able to cut wood from the dense forests, and the rapid-flowing river containing an unbelievably impressive waterfall was able to power the mill while simultaneously helping to circulate and treat the wood. Within the mill's first five years of business, the Oxford Paper Company was the only manufacturer of postcards for the United States Postal Service. It successfully produced three million cards every day utilizing the four paper machines. This trajectory continued, and by the end of the twentieth century, the company's gloss-coated paper was used for *National Geographic*, *Vogue*, *Sports Illustrated*, *Reader's Digest*, and other publications.

This success was achieved through a process that glossed over the wood through a chemical treatment to produce a smooth, white surface. The Oxford Paper Company, which was running operations in this River Valley mill, failed to mention any sort of potentially catastrophic environmental and health impacts which could be experienced by the mill's laborers. Although the water and wood supply has stayed relatively steady over the past 118 years, the number of machines and laborers has dramatically decreased. This imbalance has shifted economic production, radically transforming the commodifiable outputs of the mill. Cayer states that "despite decades of air and river pollution, labor precarity, exploitation, and loss of life that has helped the foul-smelling region earned the title 'Cancer Valley,' the force of the technological sublime is upheld and reproduced... because the *experience* of the sublime has been recorded, circulated, and commodified on the very paper that the mill produces, and which may live longer than the mill itself" (Cayer, 2021). The River Valley mill continues to operate under the ownership of a Chinese paper company named Nine Dragons.

Over the past couple of decades, mill workers' experiences have become increasingly more centered. *When We Were the Kennedys*, by native Mainer, Monica Wood, recounts her experiences growing up in Mexico, Maine, a neighboring town to Rumford. Wood tells stories of tragically losing her father who worked in the mill and experienced unknown health conditions causing his death. She views the mill to be an all-powerful, God-like structure with immense influence to control the workers and therefore the community. Kerri Arsenault's book also challenges the mill's sublimity in *Mill Town: Reckoning With What Remains*, in which she describes her upbringing as she searches for answers in and from her community which continues to remain silent. She analyzes the power dynamics that she presumes have caused her community to refuse to advocate for themselves. Arsenault searches for explanations of the

catastrophic environmental tragedies and the incredibly high rates of fetal cancer in the region which continue to be dismissed at the cost of the mill.

As time progressed, the detrimental health implications of working in pulp and paper mills became increasingly apparent. Laborers in these industries were consistently exposed to chemicals and substances, such as hydrogen sulfide and other sulfur compounds, chlorine, chlorine dioxide, sulfur dioxide, terpenes, and paper dust (Torén et al., 1996). Although the level of exposure varied depending on the stage of the process the individual was working on, such as sulfite, sulfate, groundwood, bleachery, or paper production, each process came with its own unique risks and implications. With this being said, across all specialties of work, an increased risk of lung cancer existed among workers. Despite studies reflecting inconclusive results with regard to the etiologic agents, maintenance workers continued to be at an increased risk for lung cancer and malignant mesothelioma, indicating that the group had been exposed to asbestos and/or chlorine compounds (Torén, Hagberg, et al., 1996).

As the mill industry began to recruit increasing numbers of community members as laborers, the number of people falling significantly ill simultaneously changed, making the correlation an important one to research. The *American Journal of Industrial Medicine* analyzed the literature and studies regarding the toxicity of work environments in pulp and paper mills as associated with malignant diseases. As the mill occupation expanded, reports of impaired lung and respiratory functions increased. Scientist and researcher Kjell Torén with fellow associates studied the health effects of exposure. Through these, he researched exposure, obstructive airway diseases, hypersensitivities, cardiovascular diseases, and malignant diseases (Torén, Hagberg, et al., 1996).

The entire process of pulping requires removing wood fibers by stripping the lignin and hemicellulose of the trunk. In terms of physical structure, lignin is found on the outer cell wall of the biomass. Within a lignin shell, cellulose is located. The hemicellulose is found both within the cellulose and also between the cellulose and lignin. With that context in mind, the entire pulping process is to obtain those fibers, which eventually make paper. Prior to pulping, the logs need to be sorted, debarked, and chipped. All methods of obtaining fiber require an acidic process involving sulfite, sulfate, and high-speed forces. In the majority of mills, the pulp created is bleached in order to increase the whiteness of the pulp by removing any remaining lignin or coloration in the pulp. The extent of bleaching depends on what the paper is being used for and the requirements of the client. As mentioned before, a common practice was to bleach the pulp using chlorine and chlorine dioxide. To complete the paper production cycle, the pulp is dissolved in water with other additives. It is then poured onto a moving screen in a larger machine. The water is then drained, leaving behind a dry mat of pulp blend which is further dried through steam-heated cylinders. Once dry, the paper is cut, folded, or rerolled depending on the final product.

Every step of the process may result in the inhalation of wood dust, terpenes, and other related compounds. The pulp mills expose individuals to microorganisms while handling fresh, damp logs. Different species of toxic mold such as *Aspergillus*, *Mucorales*, *Penicillium*, and *Trichoderma*, have been identified on the lumber (Torén, Hagberg, et al., 1996). Between the 1950s and 1960s, average concentrations of sulfur dioxide in normal conditions ranged from 0.1 parts per million (ppm) to 50 ppm (Torén, Hagberg, et al., 1996). During periods of production disturbances and maintenance work, the concentrations could reach upwards of 210 ppm (Torén, Hagberg, et al., 1996). Although it is important to keep in mind that these numbers are not

always consistently accurate because they vary throughout the day due to the stage of the process or season, the primary takeaway is that the concentration of sulfur dioxide ingested by workers on a daily basis is hardly ever zero. Reduced sulfur compounds are emitted from the sulfate process when the sodium sulfide reacts with the lignin. This toxin enters the bloodstream and correlates with poisoning accidents in pulp mills (Torén, Hagberg, et al., 1996). Consumption of chlorine and chlorine dioxide is a major risk for laborers working in the bleachery. Paper dust is inevitable because of its potential to be minuscule in size. Within these small samples, researchers found fibers from talc, kaolin, and wollastonite.

The majority of mortalities of pulp or paper mill workers due to respiratory diseases were not mentioned or acknowledged by any party involved. Jäppinen and Tola (1990) observed an excess number of deaths from respiratory diseases among male workers who were exposed to sulfur dioxide. Wingren et al. (1991) noted an increased risk for obstructive airway diseases among workers. A study done by Torén et al (1996) confirmed increased mortality from asthma and chronic obstructive pulmonary disease among employees in pulp and paper mills with high dust levels. Although it may not come as a surprise, the owners of many paper mills denied any likelihood of deaths being due to the work conditions for their fear of closure or financial repercussions. The power dynamic between the laborer and the mill companies was so significant that the worker's struggles and efforts to resist were repudiated at any cost (Cayer, 2021). Far more people sought jobs than the mill had to offer, resulting in employees being seen as disposable and easy to replace. This put their jobs in an unstable position, sending a clear message of the mill's power.

Meanwhile, at River Valley in Rumford, Maine, the mill stacks released smoke along with the stench which festered in the valley, while the fumes, heat, and steam released from the

pulp and paper mill process slowly poisoned the millworkers. In 1991, the *Los Angeles Times* wrote an article on four people residing in “Cancer Valley,” also known as Rumford, diagnosed with a rare lymphoma. This article eventually led to a seven-year, 8.8 million dollar study of millworkers' health. Led by Johns Hopkins University epidemiologist, Genevieve Matanoski, and funded by the American Paper Institute, this study analyzed 52 pulp and paper mills. Overall, this study shockingly proved to be inconclusive. Matanoski et al. (1998) write that “the project examined the mortality of workers in the pulp and paper industry and found that their overall mortality and their mortality for most specific diseases were low compared with the U.S. population... [Examination] of subgroups of workers suggests that their mortality may differ depending on different pumping processes and work areas in the industry. However... [no] data examined specific exposures... [and therefore] these findings raise questions that must be answered with more depth studies of processes, work histories, and exposures in the industry” (Matanoski et al., 1998). This lack of clarity reflects an understandable frustration as well as a long, dense, history of dismissal, denial, and overall in conclusion.

Kerri Arsenault's book, *Mill Town*, also addresses this aggravation through a personal and heart-wrenching lens. She performs her own study in which she recruits a local doctor, Dr. Edward Martin, to publicize what he thought was happening to millworkers and their families. She reports that in 1981, Dr. Martin received a four-year study conducted by the American College of Surgeons using data from over 700 hospitals reporting over 1.5 million cancer cases from 1972 to 1986 in the United States. She states that “Doc Martin brought the report to the board of directors at Rumford's hospital. ‘They said the report was bullshit... After they saw it, the report disappeared.’ Subsequently, the Maine Department of Health conducted a Chronic and Sentinel Disease Surveillance from 1984 to 1986... [showing] a high incidence of lung disease,

aplastic anemia, and cancer... The state epidemiologist said those findings were just preliminary and inconclusive” (Arsenault, 2020).

In the mid-1980s, the Environmental Protection Agency (EPA) found high levels of dioxin in the fish of Maine rivers. Fish found in the local Androscoggin River was ranked to have among the highest concentrations of dioxin. Despite this valuable information being true, the Maine Department of Environmental Protection continued to argue that the levels were not severe, even though dioxin was known to be toxic (Arsenault, 2020). Dr. Martin wrote to former Governor Angus King, resulting in his claims being nearly immediately dismissed. He was then reported to the IRS, the State Board of Medicine, the State Medicaid program, and the Medicare program, and he was denied access to the hospital (Arsenault, 2020). In the book, Arsenault speaks to Dr. Martin’s widow who states “[Her husband]... tried to speak up about what was happening... When he stumbled on what he thought was causing all [of] cancer [cases] in town, they did everything to destroy us” (Arsenault, 2020).

Although mill owners have made changes to procedures and waste protocols according to Maine toxicology studies, the fish residing in the Androscoggin River show high dioxin concentrations at cancerous levels at sampling points near the Rumford area despite local officials continuing to downplay the need for attention (E. Smith & Frohmberg, 2008). George O’Keefe, the director of economic development for Rumford, insists that there have been serious improvements in departments of health and safety since the “Cancer Valley” period of the 1980s. He claims there to be an elimination or drastic reduction in odors and emissions and decades of investments made to protect the water quality (Routhier, 2020). In an email from O’Keefe sent to the *Portland Press Herald*, he writes: “While we understand and respect Kerri’s point of view, in

particular given the illness in her family, it is worth remembering that this story is about the town of Rumford's past and not our present and future" (Routhier, 2020).

The health debacle caused by the mill process has caused tension between the community and the operation controlling the town. Workers are often seen as helpless and at mercy of the mill as though their lives are dependent on it, which perhaps is still the case for some. This is demonstrated clearly through questions raised by Arsenault's book. Although the paper has been made in Rumford since the 1900s, the mill was bought in 2018 by ND Paper. Brian Boland, the current vice president of government affairs and corporate initiatives, refused to comment on Arsenault's book on behalf of the company (Routhier, 2020). He continued to deny any link between papermaking and cancer, regardless of any evidence that was shown. Boland insisted that the company prides itself on minimal environmental impact and using sustainable business practices, a claim he could not support but repeatedly stated (Routhier, 2020). As of 2018, lung cancers in Oxford County, where Rumford is located, were significantly higher than anywhere else in the state (Yob et al., 2019). Maine cancer rates as a whole were also flagged as being much higher than other rates in the United States for nearly the fiftieth year in a row (Yob et al., 2019).

While the physical health effects of the pulp and paper mills were tangibly felt by the workers, families, and general community, there has been more attention and emphasis on the health repercussions rather than the environmental degradation that has been heavily impacted. Although the pulp and paper industry has been a historic foundation of Maine's economy, it has been a major generator of pollution to the state's air and waterways. The industry remains in a steady decline for the past several decades ever since the Great Recession. The U.S. EPA states that the pulp and paper industry is a top culprit of toxic chemical release (Auer, 2018).

Following shifts in economic patterns, one might logically predict that the quantities of toxic chemicals released would also decline. Defined by the EPA, releases of toxic chemicals consist of onsite discharges to the air and water, onsite land releases (including the disposal into landfills and surface impoundments, leaks into wells, and land-based spills and leaks), onsite recycling, energy recovery, and treatment. Across the United States, the pulp and paper industry is responsible for a significant portion of the total toxic chemicals released into the environment. In 2015, the Toxics Release Inventory (TRI) reported that 20% of releases to the air and 9% of releases to the water were because of the pulp and paper industry. The EPA identified seven chemicals as being the primary determinant released into the environment, all of which are released by pulp and paper facilities. In 2010 and 2016, these seven chemicals accounted for about 87% and 97% of total TRI releases (Auer, 2018).

Shifting market conditions and overall globalization of the industry have resulted in the closure of many mills in Maine. As a result, employment in the sector has reduced by 28% between 1980 and 2000 (Auer, 2018). Amazingly though, the productivity of the mills has increased. Within the most recent decade, a low point in total toxic releases has been achieved by the industry, followed by another downward trend in 2012. This is also a potential result of five of the eleven mills closing between 2014 and 2016 (*Figure 2*).

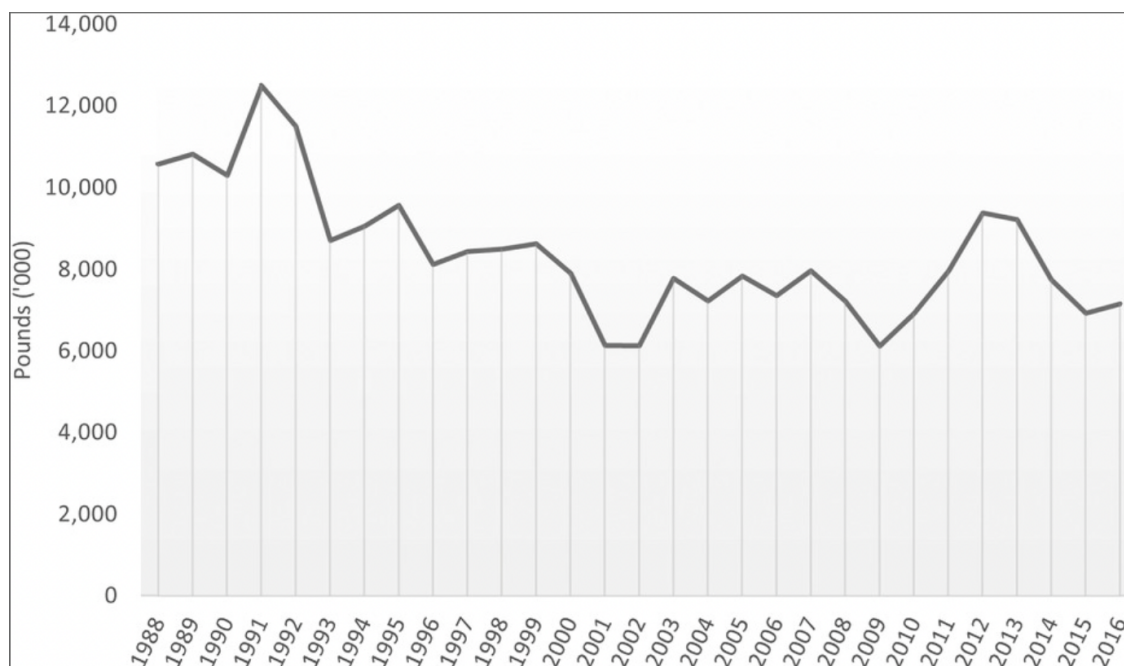


Figure 2. This graph exhibits the total quantity of on and offsite released TRI chemicals connected with the pulp and paper mill industry (2020 TRI Factsheet for Maine | TRI Explorer | US EPA, n.d.).

In a similar comparison to the health implications, the relationship between industrial decline and environmental toxicity is poorly understood due to the lack of research in the area. While the sector's economic troubles have been widely analyzed and reported, the environmental effects of the decline have not been studied extensively (Auer, 2018). Although mills have shut down and the operating procedures are deemed to not release so many chemical toxins, the seven top TRI chemical releases remain to be tragically high as they continue to persist in the atmosphere. Changes in concentrations within regions have shifted due to alternative direct-release approaches to air and water, such as directing greater portions of waste streams to onsite energy recovery and both on and offsite treatments.

Concern regarding the pollution from pulp and paper mills in Maine dates back to 1929 when citizens of Lewiston and Auburn complained about hydrogen sulfide odors exuding from the Androscoggin River (Auer, 2018). It was apparent that the mills were an obvious suspected source. In 1941, there was a period of heavy pollution discharge which was complemented by minimal water flow conditions. Initially, this issue caught the attention of Governor William Tudor Gardiner in 1935 and 1937. His Department of Health did not have the funds nor employees to survey the river, so he requested the paper industry to sponsor a report. The industries claimed to do an extensive report, but predictably, they gave false and insufficient information about the degree to which they were polluting the Androscoggin River (Judd, 1990). A water-borne stench and corrosive fumes began to physically drive families out of their homes (Judd, 1990). People who could afford to move opted to do so – beginning the economic decline of Lewiston and Auburn. This led to a report by the Maine Sanitary Water Board, which found that 92% of organic waste discharge into the Androscoggin River had originated from pulp and paper mills along the waterbody (Auer, 2018; Judd, 1990). Moving forward, the incident continued to spiral and eventually resulted in one of the first grass-root antipollution campaigns in the United States, ultimately beginning one of the nation's most effective pollution control systems (Judd, 1990).

The years between 1941 and 1961 brought a significant shift to Maine's mainstream political thinking which culminated in a strong foundation for the environmental movement across the United States (Judd, 1990). The transition began from an old-style conservation way of thinking where natural resources were extractable for economic benefits and viewed to be disconnected from humans to advocating for the prioritization of environmental health and well-being. Early pollution control measures were shown through the economic aspirations of

business leaders who were threatened by the river's inevitable degradation and who saw the controls as barriers to economic growth. Campaigns advocating for clean water through increased regulation and restriction advanced the environmental movements, and therefore limited potential prospects for industrial regulation in Maine (Judd, 1990).

Pollution entering the river caused tension between the community and mill business owners. Business leaders located upriver continued to convince others that the mills were not the cause of the funky, peculiar smells and strange foam appearing on the river banks. Lewiston businessmen pretended to care about the river's health by proposing a river clean-up, which never truly happened. Operating within ideological and financial restrictions shared by the capitalists, Edgar St. Hillaire explained to the community, “We are not interested in pure rivers... We want to get rid of the smell” (Judd, 1990). This comment, made on behalf of the business capitalists, reiterates that they did not care about the true health of the Androscoggin, but they would go to great measures to hide any trace of pollution that could be occurring.

The Federal Water Pollution Control Act of 1965 directed each state to create water quality standards in an attempt to hold major sources of pollution accountable. Many existing industries were able to avoid making changes to their practices until the early 1970s. Even as late as 1967, fishery experts in Maine reported that there were “no restrictions on the amount of pollution that can be discharged into the Androscoggin River” (Judd, 1990). The Androscoggin River in particular was seen as a dumping ground for all waste, and there was no point in trying to repair the environment. Industrial conditions occurring above Lewiston prevented uses other than sewage transport. Official reports claimed the Androscoggin to be a “cesspool” with water tests consistently showing no dissolved oxygen present. In the early 1970s, Maine still remained

far away from its goal of clean waters. However, environmental awareness was escalating and community passion continued to ascend.

Tourism and mills have an interesting relationship, moreso because they do not appear to have any obvious connection to one another. The railroad is a shared symbol of progress for both the mill industry and tourism. The railroad enabled larger groups of upper to middle-class individuals to experience Maine's beauty, and it also transported goods to and from the mills while also bringing new residents to work at the mills. Railroads built new supplier industries and created outlets for timber products to facilitate travel across Maine.

In the 1970s, Maine had begun to shift from its industrial foundation to a tourism industry which was increasingly gaining importance despite its seasonal dependency. During the recession of the early 1980s, Maine arguably suffered less than other states because it had built up a relatively resilient mix of industrial components. At this point in time, many industrial mills were still active despite many closures, and the tourist service economy was also increasing.

As summer colonies continued to grow and expand, it became clear that people enjoyed fleeing to Maine's coast. Maine's economy, shifting from being industry-centered to tourist-centered, brought an interesting set of tensions and challenges. The mill industry towns gradually became increasingly polluted and vacant, leaving behind contaminated waters and ill, impoverished communities. This was contrasted with the coastal towns which were flourishing due to the flocks of families traveling from southern states to enjoy Maine in its most scenic facade. Advertisements for coastal travel descriptions highlighted the clean, pristine sides of Maine, failing to mention the immense pollution, inland, caused by the industrial segment. Travel literature "retold the story of frail young Theodore Roosevelt, who after two short but invigorating summers in the Maine woods emerged a potential leader of the nations" (Judd,

1988). Although this featured Maine woods in an admirable and sophisticated way, it falsely advertised the average use of forestry in Maine. It was safe to say that the majority of summer colonists did not know the true foundational use of Maine woods.

In contrast to the crowded, hectic industrial centers vacationers were fleeing, the majority of tourist literature in the 19th and 20th centuries painted Maine to be the “true poetical conception of the wilderness in all its beauty, unpolluted by the march of modern progress” *Board of Trade Journal* 9, 1896. Tourist literature exaggerated and disregarded the true extent of rural Maine’s preindustrial identity and failed to acknowledge the industrial progression introduced by the mill manufacturer or the immense amount of pollution that was simultaneously being emitted into the waterways tourists were traveling distances to enjoy. The tourist landscape entirely reshaped Maine’s relationship between the economy and nature. The values in the natural world became less about use and more dependent on aesthetics and beauty.

The major cities in Maine serve as a reflection of 19th-century technologies. The towns deemed productive for the textile industry during the Industrial shaped routes for rail and highway routes persist today (Irland, 1989). Railroads enabled supplies to get to parts of Maine that were newly developing, and they also allowed products to be brought from Maine to other places. Although Maine’s textile industry has significantly decreased since then due to overseas production, the progress of the 19th century can be symbolized by the railroad (Irland, 1989) especially because rail travel opened new possibilities for the expansion of tourism -- which became the next cultural identity of the state of Maine. The lakes inland of Maine became popular destinations beyond the initial attraction of the beautiful, rocky coast. As the textile industry expanded and later changed shape, Maine earned its name in both industry and tourism (Irland, 1989).

PFAS on Farmlands

Despite agriculture being another historic driver of Maine's economy, its role in much of public discourse today serves as the medium for the recent phase of invisible environmental toxicity. The mill industry was the face of environmental toxicity throughout the 20th century, but transitioning to the 21st-century per-and-poly-fluoroalkyl substances, commonly known as PFAS, are the new threat to the Maine landscape. Although the contamination spread by the mills has not disappeared, it is no longer at the forefront of Maine media. Instead, the detection of PFAS on Maine's landscape across the entire state has blurred the lines of an idyllic Maine.

Although PFAS can toxify in many ways, in Maine, it is most commonly known to have been applied directly to farmland through contaminated sludge. From the 1970s to the 2000s, hundreds of fields had sludge spread on them. Sewage plants detoxified household and industrial wastewater to standards set by the government and eventually released the wastewater back into the environment. The solid sludge left behind in the process was cleaned up further to become a compost or fertilizer known as biosolids. Biosolids can be full of nutrients and have the potential to create healthy soil to grow flourishing crops. Due to the low operating costs, composting sludge in this way greatly benefitted wastewater plants.

PFAS was a huge concern in wastewater because it washes down drains from products such as nonstick pans, waterproof fabrics, makeup, and more. Since new research has been released, PFAS in wastewater is less of a concern, but still a possibility due to the high use of PFAS in various products. Biosolids concentrated in PFAS are therefore returned to the environment at a detrimental cost. According to Sarah Alexander who works with the Organic Farming Group, the effects of sludge are influenced by factors such as the size of the contaminated area, the amount of fertilizer used, the source of the wastewater used to create it,

and the crops grown on the land since the year the sludge was added. Maine, along with other states across the country, has not adopted limits on PFAS in the sludge of the surface water into which facilities discharge, making sewage plants not required by law to filter PFAS out of the water. Although PFAS comes from a variety of different sources, some of the worst PFAS contamination in Maine is correlated with paper mills that used the chemicals in their protective coatings.

Maine agriculture officials are working with over 50 farms which have all been contaminated with the forever chemicals. When a farm has been identified as having PFAS, it can no longer operate in the same way and is often deemed useless. The state is currently extensively testing over 700 places that could be affected by sludge contamination. Alexander reiterates that “water is a more straightforward and... the best indicator of contamination... soil contamination leads us to product contamination and looking at crops that are being grown in that soil.” Due to varying biological compositions, various crops absorb and store PFAS differently. Farmers who have been tested and found contamination on their land have had to pull their products from sale and have been working closely with the state and other nonprofits to create the next steps. So far, 56 farms have proved to be contaminated, and 23% of the ~1500 groundwater samples from agricultural sites and residential wells have shown significant traces of PFAS (Miller, 2023).

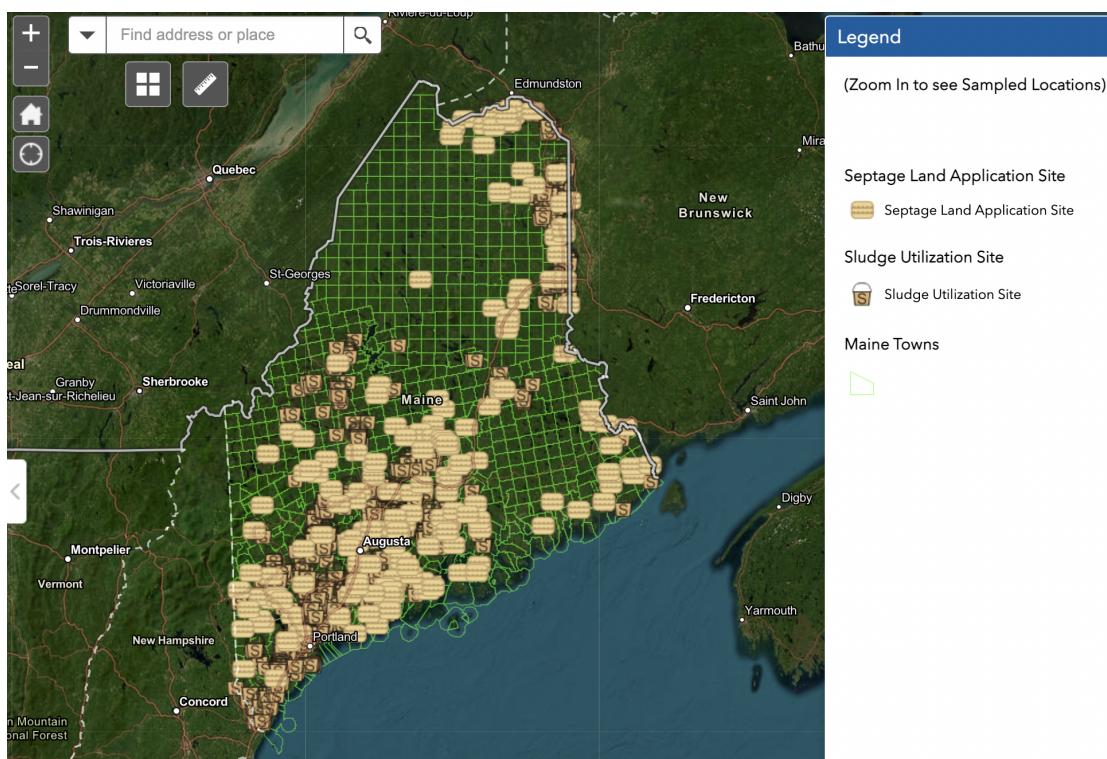


Figure 3. This ArcGIS map depicts groundwater and soil data collected by the Maine DEP. It identifies all locations where septic sludge was applied (*ArcGIS Web Application*, n.d.-b). When interacting with the map, clicking on the symbol informs the types of PFAS and the concentrations found from the test.

Many people, residents and tourists alike, want to escape the urban realities of their hectic lives and reconnect with the natural world in Maine's wilderness. A huge recreational draw to Maine is freshwater fish. Recent research has shown newfound dangers of consuming freshwater fish because scientists continue to find high levels of PFAS in certain bodies of water in Maine. Extremely high concentrations of PFAS have been found in freshwater fish, in particular. According to a study done by the Environmental Working Group (EWG), consuming one average serving of freshwater fish is equivalent to drinking PFAS-contaminated water regularly for a month (Barbo et al., 2022).

After analyzing fish from three major rivers in Maine, it was found that fish from these rivers had much higher concentrations of PFAS than commercial fish. The CDC has advised that, as a precaution, fish should not be consumed from those rivers and from several other locations. This is contradictory to the narrative that has been told about Maine fishing; traditionally, Maine waters have been safe for fish, and therefore fish consumption has been extensive. Fishermen in Maine, both residents, and tourists, now need to remain cautious of their fish intake, and most importantly, aware of the grave, safety precautions. PFAS infiltrating the soil and waterways of Maine territory has taken over mainstream media across the country. This tragic era of PFAS has tainted Maine's reputation for fishing recreation and has exposed another invisible toxicity of Maine which some have attempted to keep a secret for decades.

Similar patterns are true for wild game meat, another draw of Maine's wilderness. Upon the discovery, in November of 2021, that numerous animals had shown elevated levels of PFAS in their bloodstreams, there was a "do not eat" advisory issued for any deer harvested in the Fairfield area. Especially in northern parts of Maine, deer, and moose, in particular, serve as large resources for meat-feeding families for the year. The hunting season also helps to mitigate animal populations to balance ecosystems. With hunting restricted, deer populations have increased along with the ticks across the state. In a news interview, former Fairfield hunter Joe Lefebvre says, "Everybody that's hunted, it's already in our systems. We've been eating bird, turkey, [and] deer for years here. So everybody's contaminated. There's no question about it." Lefebvre says his neighbors have found high levels of PFAS in their bodies. Hunter Josh Adams solemnly states that "It's definitely unnerving to think about taking an animal and not being able to use it." Depending on the land for nutrients is a traditional way of life in Maine, and it is certainly one of the major appeals to living or recreating in the state. With that in mind,

contamination has forced residents to rely on alternative methods, and some hunters from “away” may be less inclined to hunt.

Since a primary passage of PFAS contamination was through sludge application on farmlands, it has caused people to be much more cautious about buying produce from small farms in Maine. Farmers' markets are another historical draw illustrating a quaint life. Between an increased awareness of PFAS and the COVID-19 pandemic, farmer markets attendance across the state has decreased significantly. Farmers' markets are a way for small business owners to join together to share products and interact with the community. Although it is rarely admitted, the caution around the food comes down to an overarching theme of trust. Communities are becoming less trusting of their land as though it has betrayed them.

Especially since the COVID-19 pandemic, tourist rates have increased along with population growth. Maine, New Hampshire, and Vermont all gained an influx of new residents as individuals escaped their urban lives which, during the pandemic, posed various risks to physical and mental health (*Figure 4*). People craving a simpler, wholesome way of life started moving to previously less populated states to get more distance and space from their neighbors. Although this is beneficial for Maine's economy, visitors are falsely receiving an image of Maine which is pure, untouched, and pristine. While Maine is beautiful externally, realtors and vacation destinations do not like to mention the poisonous land or toxic waterways because that taints the idyllic vision of what businesses and advertisers have described. There is irony in the notion that Maine's population is increasing for more people to live a simpler life where they can depend on the land and build closer relationships with natural landscapes, but then upon moving, they discover they can not grow food on their soil, they can not fish in the streams, and they cannot hunt for game without posing potential risks to their health.

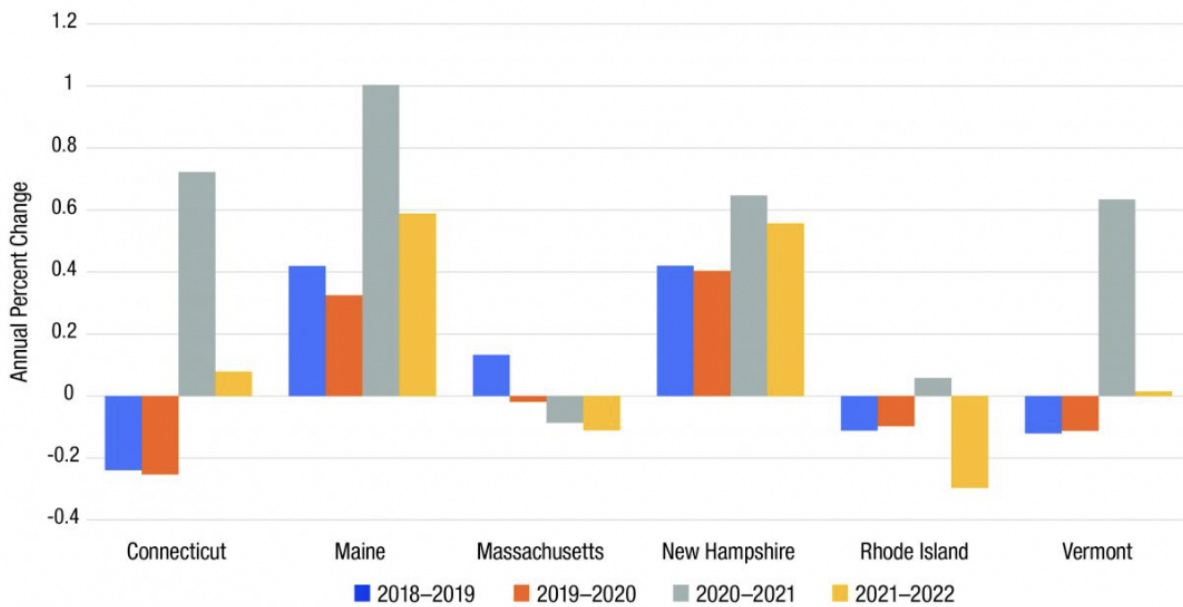


Figure 4. This graph shows the annual population percentage change for New England states from 2018 to 2022. The analysis was done by K.M. Johnson based on U. S. Census Bureau Population Estimates (Johnson, 2022).

Although PFAS is a serious part of Maine’s toxic environmental history, public marketing and advertising can hide its existence because it is invisible. This makes dangers of toxicity common for individuals newly moving or visiting Maine to engage with environments they do not know are contaminated. Despite PFAS becoming increasingly discussed and analyzed, the serious health implications are easily ignored since there is no visual component to the contamination. People move to Maine for the aesthetic values it has to offer. The invisible toxicity of Maine does not interfere with the visual beauty of the state but rather with the chemical makeup impacting the health of all species relying on the land for survival.

The high rates of PFAS in the soil even have implications for the current era of service industries. While the mills created division and tension between the coastal towns and the inland

regions, the PFAS issue does not have the same boundaries. *Figure 3* shows places across the entire state that are currently contaminated with PFAS. Wealthier, affluent towns are experiencing and expressing many of the same concerns as the more impoverished towns inland. Tension appears especially after contamination is identified. Tests are difficult to receive and extremely expensive. Once results have been returned, remediation processes have not been extensively determined due to how new PFAS discoveries are. It would primarily involve purchasing a pricey water filtration system, which is not a realistic investment for some towns and/or individuals. PFAS is a public health crisis, and answers are not straightforward. Furthermore, potential solutions require an extensive amount of resources, money, and support. The government has been working to release different aid packages to alleviate some of the burdens, but it is not enough, and arguably, wealthy towns might access the resources more readily.

Especially since the majority of the communities impacted are farm towns, PFAS has absolutely uprooted, and in some cases, destroyed the livelihoods of many. Although it has decreased over the past century, agriculture still remains to be one of the largest economic and cultural sectors Maine has to offer. Being able to live off the land and provide nourishment for families through food found in one's very own community is highly sought-after process. PFAS obliterates that for afflicted farms and creates for them a significant disconnect between humans and the natural world. As mentioned previously, many of the more recent individuals moving to the state seek simplicity, community, and relationships with the environment. PFAS makes that relationship much more complicated.

For example, Maine Farmers Johanna Davis and Adam Nordell, of Songbird Farm in Unity, bridge the gap between being victims of PFAS contamination and advocating for their

livelihoods. The 17-acre farm is located in an idyllic setting near Maine's central coast. The couple moved to Maine in search of an authentic way of life. When they purchased the land in 2014, they had no idea about the land's history; all they saw was a beautiful plot of land with viable soil, a pristine ocean, and a strong community nearby. They were shocked and devastated when they learned, in December of 2022, that the farm's previous owner had used PFAS-tainted sludge on the land decades earlier. The previous owner had resided on the land for about 25 years but was dying of pancreatic cancer and wanted to sell it to a young family who wanted to utilize all the wonderful features the land had to offer. Unbeknownst to him, there was a high chance that the land he loved so much may have been secretly killing him.

Upon testing their soil, drinking water, irrigation water, crops, chicken, and blood, scientists discovered that the land contained high concentrations of PFAS. The farm had been serving the community for years, and now, Farmers Davis and Nordell were suddenly faced with having to reveal that they had been unintentionally poisoning anyone who supported them. Of course, the previous farmer had been unknowingly doing the same. In an interview with the *Guardian*, Nordell states, "This has flipped everything about our lives on its head. We haven't done a blood test on our kid yet and that's the most terrifying part. It's fucking devastating." Throughout the other interviews, neighboring farmers admitted that they hid information they had about PFAS contamination because they feared economic ruin, community fear, and likely, shame.

Beyond the physical additive of sludge on the land, PFAS can spread. Once Songbird Farm came out about their contamination, Ironwood Farm which is 6 miles down the road, also found high levels of PFAS in its water which is suspected to have migrated from a sludge field. Farm owner Nell Finnigan opened up to the *Guardian* in his interview stating, "I spent my entire

adult life building this farm. Everything is at stake for us, and this is a tragedy for anyone who comes up with a high well test.”

Stoneridge Farm discovered in 2016 that sludge and paper mill waste was used at their farm. In response to the high rates of PFAS found, Stoneridge had to kill the majority of the livestock they had in 2019. All of the products sold in nearby markets had to be pulled, and subsequently, they lost a lot of money. The family believes PFAS has caused health ailments ranging from thyroid disease to reproductive problems (Perkins, 2022). Most of these affected farmers have been surviving on savings, welfare, and the generosity of friends and family. Stoneridge Farm recently got approved to sell some of their contaminated food – due to a decrease in concentrations, but despite his dwindling bank account, he could not bring himself to do that to his community (Perkins, 2022). He states, “This is the cost of having a moral compass and doing the right thing. I don’t know how we are going to get debts paid. I don’t know how the Christ we are going to live. I don’t know how we are going to survive” (Perkins, 2022).

PFAS is tasteless and odorless, making it invisible. It does not take away from the landscape or cause any physical impairments to a scene. This is the danger of it. At the rate Maine is currently, it is difficult to avoid making all residents vulnerable to the toxicity humans have previously put into the earth, and now the environment is fighting back. It serves as a taste of our own medicine. PFAS is the perfect example of the ability to avoid and refuse ownership for the actions caused to hurt the environment which ironically, now is hurting humans. Though some communities may be more at risk due to certain regions’ higher prevalence of PFAS, the health implications that come with ingesting any amount of PFAS are unbiased; inequity in its victims is a non-issue.

Conclusion

The relationship between mill contamination and PFAS may not be obvious, yet both have denigrated the purity of the Maine landscape. Although mills have been a significant source of Maine's economic sector, the environmental degradation they have caused has resulted in the contamination of Maine's soils and waterways. Despite manufacturers not knowing it at the time, the toxins in the mills caused illnesses for communities nearby, eroded rivers due to hydropower dams, and destroyed natural ecosystems near and far with the toxic chemicals.. While mills were a major contributor to PFAS in wastewater sludge due to the toxins being used in it, they are not the sole culprit.

A dichotomy currently exists between Maine's toxic landscape due to industrial use and the pristine image of "Vacationland" that lures tourists to the state. The toxins released through mills and sludge application often do not change the landscape on a global scale, and therefore the information, if known, has not been readily disclosed. This has inevitably caused subtle tensions between locals and tourists. For Maine residents, this is a public health crisis, whereas tourists are more concerned about the aesthetic value the state has to offer. It also reflects socio-economic imbalances. The majority of the mills in Maine are located in inner parts of the state where there is generally a lower socioeconomic status across populations. Historically, the mills were employed by primarily impoverished immigrants. While this is not true today, its roots remain clear with the demographic surrounding the mill region. Additionally, these lower-income communities are the ones most vulnerable to the health problems caused by mill toxification. The challenges experienced by communities in mill towns may appear invisible to communities in neighboring towns.

Thus far in the research, I have conducted an environmental history case study examining the contamination which has protruded Maine's natural resources. Public discourse around Maine is often seen through travel articles, pamphlets advertising all the activities to do in the state, magazines, and TV shows such as *Maine Cabin Masters*, all of which indulge in this fantasy of Maine being a pure, pristine state. This reflects the disconnect between how Maine is viewed on a larger scale by neglecting to acknowledge the toxicities harming Maine in the public imagination of the state as a "Vacationland." This juxtaposes narratives between two separate versions of Maine, which exist independently from one another.

The TV series, "*Maine Cabin Masters*" has drawn attention to the inner parts of Maine which have previously been ignored since the majority of tourist attention is driven towards the coastal regions. In the show, contractor Chase Morrill and his cabin construction crew, comprised mostly of her family, work to renovate cabins in the deep, remote woods of Maine. "*Maine Cabin Masters*" appears on the Magnolia network as well as on multiple streaming sources – making it the number-one show on networks in the United States. The show draws positive attention to the remote regions of Maine which are not so widely known by out-of-state residents, for it feeds into the idealization of Maine.



Figure 5. Featured on the Maine Cabin Masters on season 2 episode 2, this renovation was completed in 2018 on Clearwater Pond located north of Farmington in Industry, ME (*Clearwater Camp – 202 – Maine Cabin Masters*, n.d.).

The renovation features in *Figure 5* were located in a town in central Maine called Industry, ME. Until the Maine Cabin Masters crew took it on in season 2, episode 2, the cabin had not been touched since the 1970s. Put simply, the home was in horribly poor condition prior to the renovation and was seemingly unlivable until the crew began fixing it up. The cabin was bought by an out-of-state family who was looking for a second lake house home in a quiet area to enable them to escape their hectic lifestyle. Clearwater Pond is a small, yet substantial

waterbody which is reported to have excellent salmon, trout, smelt, and bass fishing along with good water quality. Recreational boats and fishing are permitted on the lake, featuring another positive appeal for the new owners. With the help of Maine Cabin Masters, the cabin became a cozy, well-furnished retreat by maximizing the new owners' budget of \$45,000.

As of the 2020 census data, Industry, ME is a town north of Farmington with a population roughly of ~1,000 people (*Industry Demographics - Get Current Census Data for Industry, ME*, n.d.-b). The median income for a household in the town has increased significantly over the past decade to ~\$50,000 (*Industry Demographics - Get Current Census Data for Industry, ME*, n.d.-b). In the "Maine Encyclopedia," a website that gives brief rundowns on each town in Maine, Industry prides itself on its good water supply of Clearwater Pond - both in the quality of water and the business it once brought to the town. Similar to many other towns in central Maine, Industry quite literally got its name from manufacturers at Allen's Mill (Jim & Jim, 2022). An outlet of Clearwater Pond was dammed in the 1800s to provide water power for the lumber manufacturer. Jim and Jim (2022) state that Clearwater Pond attracts anglers, boaters, and swimmers during the summer months, and ice fishers in the winter. It serves as the water supply for the town, making it the center of Industry's historic and present community.

A historically prosperous town in central Maine, Industry had languished from the 1900s to the 2000s. The population dwindled significantly after the mills closed, and the majority of families living there had incomes well below the poverty line. Presently the town has stabilized due to the interest of vacationers and tourists brought to Clearwater Pond, partly due to Maine Cabin Masters. Although the household income for Industry Maine is only slightly below Maine's average household income of ~\$60,000, it is interesting to note that it is only \$5,000 more than the renovations for the house on Clearwater Pond featured on Maine Cabin Masters.

That just addresses the division between the wealthier newcomers into the town and the residents. Although the success of Maine Cabin Masters fosters a sense of pride and even entertainment for Maine residents, it also hides variations of the reality of Maine. The show advertises a pristine, nature dynamic by capitalizing on the pond's beauty and the rural lifestyle in Industry. Throughout this example, Industry, ME which is featured in season 2, episode 2 of Maine Cabin Masters, is publicized to be an up-and-coming ideal vacation destination for tourists working to retreat from the chaos of their city lives and spend quality time with their families. This notion feeds into the "Vacationland" image of Maine's inland regions and completely excludes any of its impoverished mill-centered history.

The magazine, *DownEast*, also contributes to the glorification of Maine. Although it advertises itself to be an informational magazine on Maine, it glamorizes the state by acknowledging only alluring attributes ranging from new restaurants, to dog walks, to wildlife photography, to summer camps, and beyond. The magazine seems to be designed to give Maine residents a sense of pride and belonging for the place they call home, while simultaneously creating a vision to outsiders of what Maine illustrates itself to be. When navigating their website, one will find no mention of pollution of any sort under the "Land, Water & Wildlife," "Issues & Politics," or "History" section on the first several pages. Although some articles do discuss other important topics such as the history of colonization, the changing lobster industry, and endangered species, it is not until looking deep into the webpage until there was any mention of mills or PFAS contamination is found. Based on my navigation of the website, no acknowledgement of issues appeared of environmental justice or inequitable access to clean air, soil, and water, all of which represent huge concerns for Maine's public health.



Figure 6. Taken from the *DownEast* website, these 12 covers were the most recent features of the magazines from May 2022 to April 2023 (Down East Magazine, n.d.).

DownEast magazine advertises itself as “The Magazine of Maine,” and is the largest paid circulation of any publication in the state peaking at over 80,000 magazines purchased over the summer. The global readership is over 380,000 articles. *DownEast* prides itself on being Maine’s only audited and verified magazine. The magazine features an annual “Best of Maine” list compiled of recommendations on where to “eat, drink, shop, stay, and unwind” while in the state. Figure 6 features the 12 most recent covers for the *DownEast* magazine. All photos show the idyllic versions of Maine: the beautiful, serene, and quaint landscapes. Although it is crucial to acknowledge that this is a large part of Maine’s identity, the magazine fails to acknowledge the hardships and sacrifices Maine has endured, both literally and figuratively. Quite clearly based on the covers, the “Vacationland” image dominates the scene, and the environmental toxicity and

contamination are marginalized. The pristine nature dynamic is advertised excessively and the polluted counterpart is ignored. Despite what the magazine's description may say, the magazine appears to be designed for tourists and individuals who are not actually grappling with the challenges of Maine's toxic history.

Although the name in and of itself is centered around the coast of Maine, *DownEast* supposedly discusses news across the entire state. After interacting with their website, it is clear their focus still remains around the coast. Considering a huge population of their readers may not currently live in Maine but have some personal appeal or connection to the state, the magazine gives readers a sense of pride and comfort when they see Maine's prosperity. As mentioned earlier, the magazine has an undeniably positive view on nearly every aspect and is not the type of article that would willingly expose Maine's environmental concerns or public health debacles. Instead, the magazine applauds Kerri Arsenault for her unbelievable success with her book *Mill Town* asking her if she was "surprised it led where it did" and if she "[feels] a fondness for [her] hometown," despite the impacts of mill pollution on the environment and community health (Magazine, 2022). Additionally, despite PFAS being an increasingly widespread crisis with Maine's name at the forefront, *DownEast* only has written one article on it focusing on Misty Brook Farm (Olson, 2022). Despite the article is well written and very informational, this is one of the only detailed mentions of inland Maine in *DownEast* which is significantly polarized compared to its coastal counterparts.

While it might not be malicious or intentional, this lack of attention to the matter hides Maine's history of toxicity. Maine comprises these two identities: pristine and beautiful by nature and industrial and exploited of resources. The two identities go hand and hand, although with the industrial sector becoming less significant, the economy has become increasingly more reliant on

the tourism industry to bring in business. Although public discourse will likely continue to shift away from the contamination since that contradicts the foundation of Maine's appeal, the historical legacy of pollution through the mill industry and sludge application will impact the livelihoods of those interacting with the land daily. Roadside pamphlets and travel articles will reflect similar patterns by featuring the Maine attractions and illustrating Maine in its purest form. The majority of tourists come to Maine because of the aesthetic appeal, and therefore, advertisements seek to display this idealization. The tourism industry in Maine knows the version of Maine that individuals want to see. Advertisers are skilled at keeping them away from the images and news that might contradict that version.

Median Family Income Quartiles

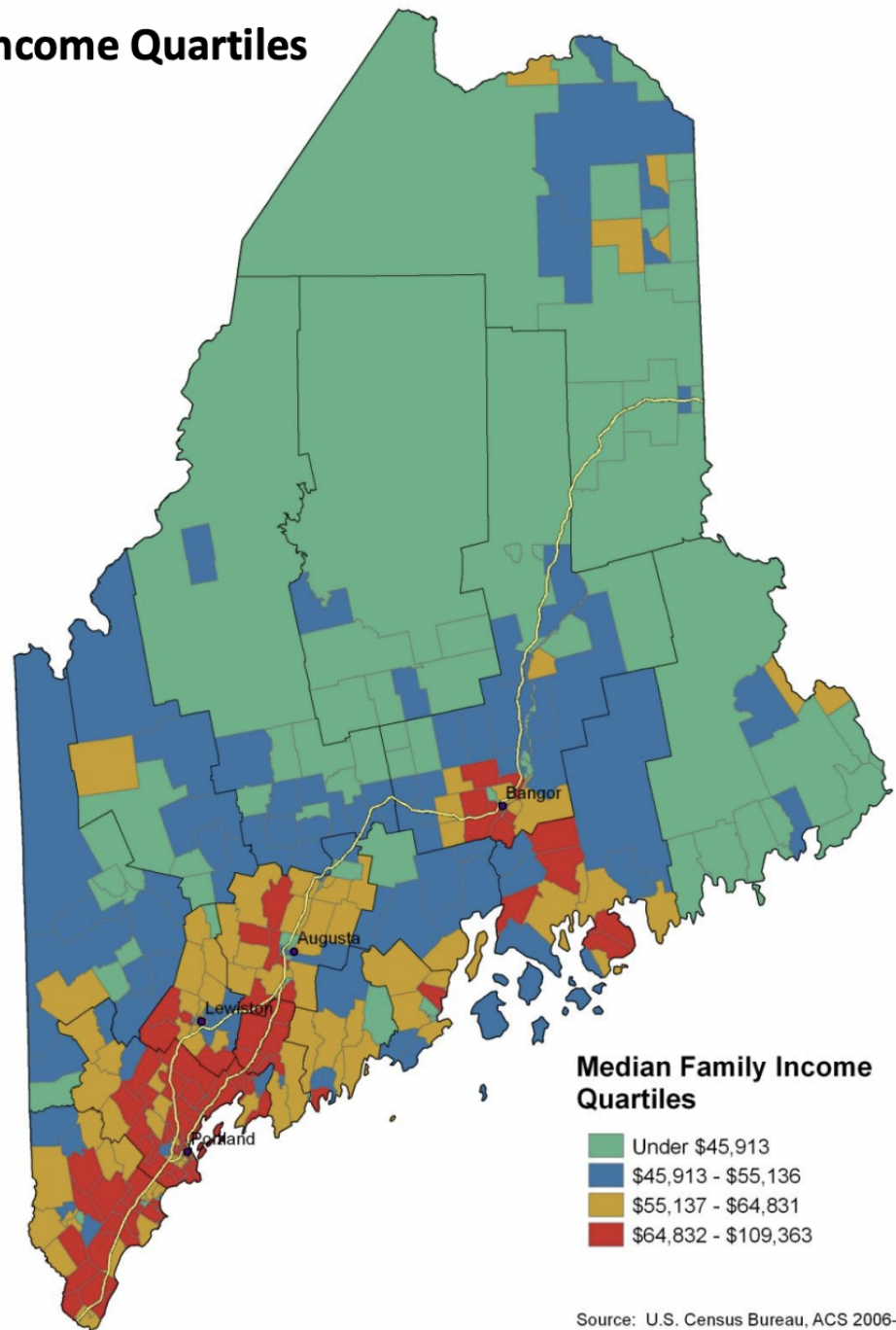


Figure 7. This map, taken from the Carey Institute at the University of New Hampshire, shows the median family incomes across Maine (Mattingly & Schaefer, 2012).

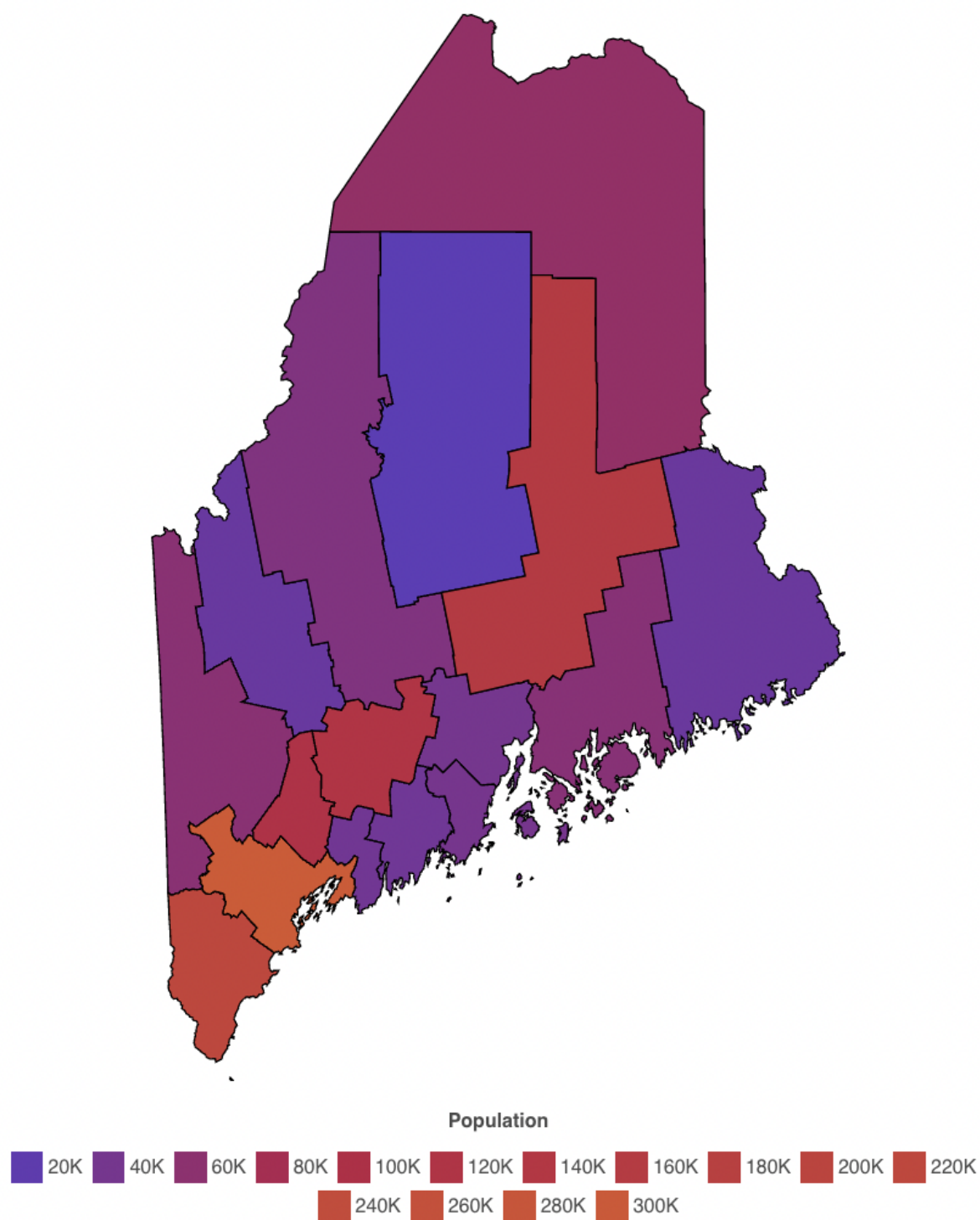


Figure 8. This map shows the population density of Maine by county as of 2023 (*Maine Population 2023 (Demographics, Maps, Graphs)*, n.d.).

Maine Statewide Population				
	2018 (historical)	2023	2028	2018-2028
Total Population	1,341,160	1,355,924	1,368,838	
Five-Year Percent Change				
Percent Change		1.1%	1.0%	2.1%

Figure 9. This chart shows the Maine statewide population growth rate beginning in 2018 and predicting up to 2028 based on previous patterns (“Maine Population Outlook 2018-2028,” 2021).

As mentioned previously, the majority of discourse around Maine is focused on the coastal regions of the state. Because of this, the “Vacationland” image Maine has adopted is mainly targeted around coastal regions, completely ignoring the inner parts of the state which are deemed by tourism agencies as being not so scenic. Although this view has shifted over the past decade as the lakes regions have attracted more visitors and newer residents, it is not so widely marketed. As shown in *Figure 7*, significant socioeconomic diversity exists across Maine. The patterns in median family income resemble where the majority of the population is - in coastal and southern counties of Maine. Although the population growth rate is continuing to increase, and is predicted to continue to increase over the next several years (*Figure 9*), the majority of the population increase is occurring in the eastern coastline and southern tip of Maine. This contributes to the idea that generally, the inner part of the state does not contribute to the image of Maine as “Vacationland.” The pristine and natural facade illustrated by various tourist agencies and appeals aiming to increase Maine’s attraction focus on the coast in a great attempt to hide the historical, industrial reality which is located in the inner, impoverished part of the state.

This research calls into question the true meaning of untouched, pristine, wilderness. Is it fair to be advertising a state to visitors craving the aesthetic of exquisite naturalness when in reality Maine has a robust economic and industrial history of manufacturing which is a driving force in the pollution? Although many of the vistas remain seemingly beautiful, the toxic invisibility infiltrating into the soils from the air and the water - deeming the land a discreet toxic wasteland —calls into question the natural state of purity. As Alexis Shotwell argues, the “ethos is the idea that we can access or recover a time and state before or without pollution, without impurity, before the fall from innocence, when the world at large is *truly beautiful... we perceive things as they should be, rather than how they are*” (Shotwell, 2016). Maine’s transition from an industrial state to one where tourism and service businesses are at the center reflects an attempt to marginalize the environmental history of Maine. The two primary public discourses surrounding Maine include a history of pollution impacting communities today, and Maine as “Vacationland: The Way Life Should Be.” Both of these narratives reside in some truth, but they intersect due to the dissonance between them. An unfortunate bond from mill contamination, PFAS, and tourism is that all have taken a toll on the purity of nature and the well-being of Maine people. Perhaps it is time to reassess Maine’s economic priorities so as to maintain an appropriate level of tourism while mitigating pollution.

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