Pipe Dreams and Crude Proposals: Community Political Engagement with the Pilgrim Pipeline in the Hudson Valley

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Abstract

Pilgrim Pipeline Holdings, LLC has proposed the construction of a 178-mile dual line pipeline between Albany, NY and Linden, NJ for the purpose of transporting Bakken Crude oil. The company claims that this pipeline will reduce the need for other methods of crude oil transport, such as oil tankers and barges, while also providing a safer and more efficient method of crude oil transport overall. Ever since the company began surveying public and private properties along the proposed route, we have seen a confluence of grassroots activists and elected officials working together to show their opposition to this pipeline and spread awareness about the potential threats associated with the pipeline. This has resulted in the passing of 30 resolutions of opposition to the Pipeline in New York State alone. With so much current national opposition to the construction of pipelines, we wanted to conduct a study of stakeholder perspectives on this topic and produce a list of recommendations based on our findings. Through preliminary research, including the use of Geographic Information Systems (GIS), we found that the pipeline will increase the transport of crude by rail through the state of New York to feed the pipeline, which is a 40-year investment in fossil fuel energy that will have little economic benefit to either New York or New Jersey. Thirteen of our fourteen respondents (the outlier being a representative from Pilgrim Pipeline Holdings LLC) were ardently against the pipeline, primarily due to local or regional concerns for water and environmental quality degradation and the potential for spills. Overall, we found six recurring themes related to respondents' concerns. Based on these findings, we suggest that the state avoid permitting the Pilgrim Pipeline and instead focus on fixing existing fossil fuel infrastructure and implementing renewable energy technologies in accordance to the New York State Energy Plan for 2030.

Key words
Pilgrim Pipeline, Bakken Crude, Semi-structured interviews, New York State, environmental advocacy, environmental justice, environmental education, human health and safety, geographic information systems, Pilgrim Pipeline Holdings LLC, crude oil, energy infrastructure

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Frequently used acronyms

AAR	Association of American Railroads
CAPP	Coalition Against the Pilgrim Pipeline
CP	Canadian Pacific Railway
CN	Canadian National Railway
CS	Colorado and Southern Railway
CSX	Chessie and Seaboard
DAPL	Dakota Access Pipeline
DOT	Department of Transportation
FAST Act	Fixing America's Surface Transportation Act of 2015
FOIL	Freedom of Information Laws
FRA	Federal Railroad Administration
GIS	Geographic Information Systems
NYDEC	New York Department of Environmental Conservation
NYDOT	New York Department of Transportation
PHMSA	Pipeline and Hazardous Materials Safety Administration
PPH	Pilgrim Pipeline Holdings, LLC
PSI	Pound force per square inch
SEQRA	State Environmental Quality Review Act
USGS	United States Geological Survey

1.0 Introduction

The Bakken Shale Formation, located in North Dakota, is estimated to contain about 7.4 billion barrels of crude oil (Demas, 2013). Although it has been extremely difficult to extract this oil in the past, it is now possible due to the technological advances of hydraulic fracturing and horizontal drilling (Demas, 2013). The United States Geological Survey (USGS) initially reported that the Bakken Shale Formation had about 151 million barrels of recoverable oil; however, in 2008 this estimate was revised to between 3 and 4.3 billion barrels of recoverable oil (Demas, 2013). Seventy-five percent currently being extracted from the Bakken Formation is sent via railcar along the Chessie and Seaboard (CSX) and the Canadian Pacific Railway (CP). The CSX goes through 17 New York counties and the CP through five New York counties, including Saratoga County, to the Port of Albany, which receives 20 -25 percent of the Bakken region rail exports (Mouawad, 2014). This oil is then shipped to New Jersey and Pennsylvania via rail or barges along the Hudson River (Riverkeeper, 2016). Elected officials, influential community members, and residents within New York have all recently reacted differently in relation to concerns over safety after a series of derailments and explosions nationwide (Mouawad, 2014).

Bakken crude is flammable and volatile due to dangerous chemicals associated with hydraulic fracturing, as well as higher pound force per square inch (PSI), and the presence of propane and ethane. While many of these chemicals are undisclosed, hydrochloric acid associated with fracking processes is suspected of deteriorating the already thin-walled DOT - III Cars, making these trains more likely to tear and explode should a train derail (Schumer 2015). The industry has made commitments to phase out these cars by 2025 as mandated by the Fixing America's Surface Transportation Act of 2015 (FAST Act), enacted by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Department of Transportation

(DOT) (Federal Register, 2016). Nevertheless, this act allows for eight years of increasing potential for derailments and the possibility for explosions. It is similarly important to note that these trains are in some cases transported on rails that are in disrepair and in need of inspection. According to 2010 data, the Association of American Railroads (AAR) reports 4600 miles of railroad tracks go through New York State, and 65% of these tracks belong to CSX, Canadian National Railway, CP, and Colorado and Southern Railway (Department of Transportation 2016). There is only one federal inspector for the 3000 private train bridges in New York is also in charge of inspecting bridges in 13 other states (Schumer, 2015).

Including the federal inspector in NY, there are only eight federal inspectors for the 70,000 to 100,000 private train bridges in the U.S., and only 1 percent of them are audited in any given year (Mid Hudson News, 2016). The Federal Railroad Administration (FRA) has inadequate funding to review railroad inspection reports (Liebmann, 2016). Senator Chuck Schumer has brought attention to the lack of funding and limited federal oversight of bridges, saying that Upstate New York "has a clear need for more railroad inspectors, and that there is simply not enough manpower right now on the federal level to inspect and audit these bridges on schedule" (Mid Hudson News, 2016: 1). As a result, the FRA has proposed doubling the number of rail bridge inspectors from eight to sixteen and create a nationwide inventory to register high-risk bridges (Mid Hudson News, 2016).

In response to these growing concerns over safety with volatile crude by rail transportation, Governor Andrew Cuomo announced a series of "Blitz" inspections by NYSDOT and the Department of Environmental Conservation (NYDEC) in February of 2014. Two of these inspections occurred at Kenyard Yard in Albany (owned by CP) and the other at the Frontier Rail Yard in Buffalo (owned by CSX), which are two of the most heavily used rail

locations in NYS for the transport of Crude Oil (Governor Cuomo, 2014). At the Kenyard Yard, the NYSDOT and Federal Railroad Administration (FRA) inspected 120 T-III cars and found three defective wheels and three defective brake shoes. They also inspected two miles of rail tracks and 31 switches and found 36 defects, including loose rail joints, fasteners, and a broken joint bar, all of which were repaired immediately. At the Frontier Rail Yard, 198 T-III cars, three locomotives, and one-yard switcher were inspected. Two of the tank cars were found to have wheel and a few others found to have brake shoe defects. Additionally, they inspected four miles of track and 13 switches. The team found seven defects, which included a broken rail that could require it to be taken out of service. The team gave the company 30 days to repair the defect (Governor Cuomo, 2014). Since Governor Cuomo's announcement, numerous other blitz inspections have been issued. The number of defects found suggest that a crude by rail derailments, spill, or explosion in NYS is highly plausible. Additionally, the governor's rail inspection blitzes do not include bridges (Nearing 2016).

CSX has not submitted its bridge management plan, and Canadian Pacific have not submitted its yearly bridge inspection their yearly certification for 2016 which are required under state Transportation Law, despite receiving legal notices in the spring requesting the information (Nearing, 2016). Though past reports have claimed that the bridges are up to standard, A CSX-owned bridge less than a mile from the Port of Albany showed cracking, and deterioration of concrete including chunks of missing concrete at the base of the bridge footings (Nearing, 2016). Moreover, the DOT has not delivered a planned computer database of bridge inspection records to include railroad bridges which were supposed to be implemented under the Bridge Data Information System (Nearing, 2016).

Figure 1: Major Rail Line Transport Routes for Bakken Shale Crude Oil. *Source: New York Times (2014).*
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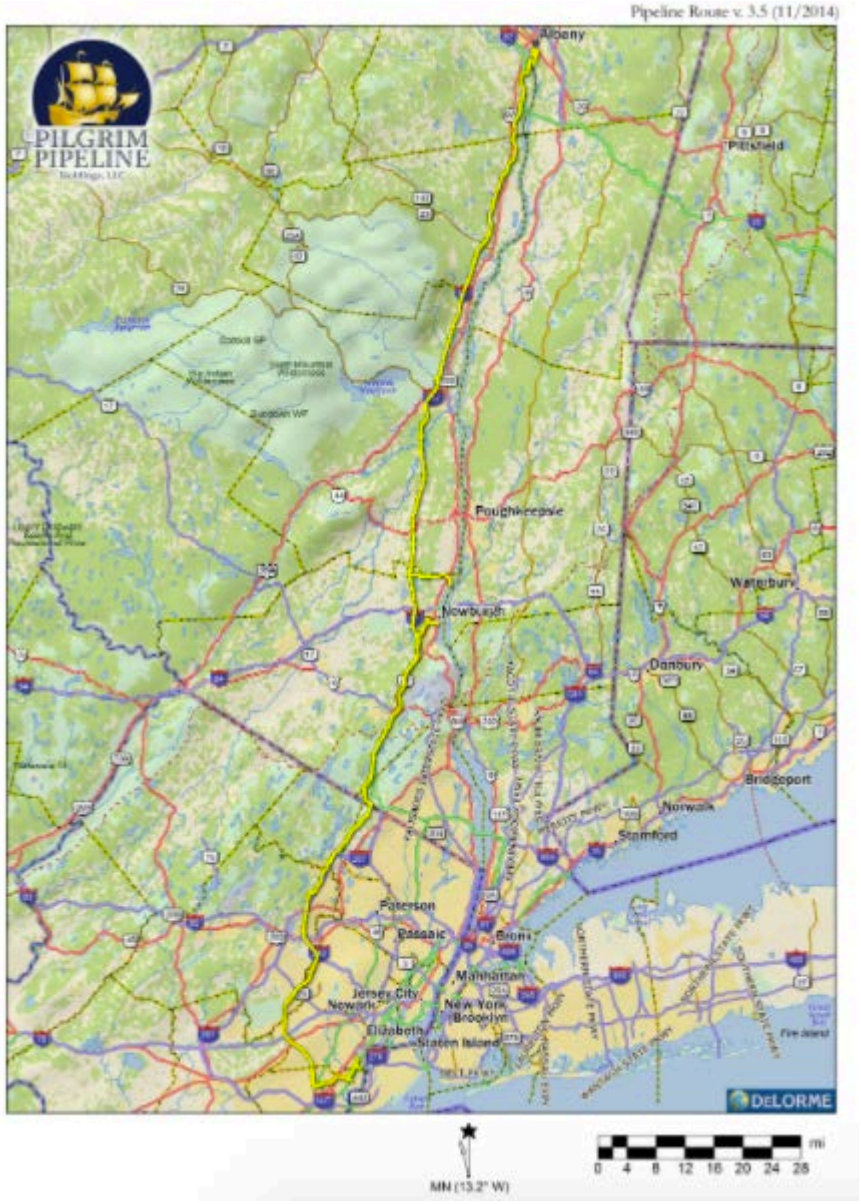
This research is a continued investigation of the 2016 capstone project Public Perception of Crude Oil Transport via Rail in Saratoga County: Policy, Safety, and the Environment (Hobbs, Mackay, Magnan, Munisteri). However, this research also incorporates a new component; the proposed Pilgrim Pipeline project, which would run 178 miles along the Hudson River, from Albany to New Jersey, replacing, to an extent, southbound and northbound shipments of refined petroleum products. These two pipelines will run from oil terminals in Albany, New York to a refinery in Linden, New Jersey, passing through five counties and a total of 25 municipalities in New York, as well as an additional five New Jersey counties (Pilgrim Pipeline Holdings CCC, 2016). The proposed pipelines will carry Bakken crude oil south to the refinery, and carry refined products such as kerosene, from the refinery north to the Port of Albany. In order for the pipeline to be economically feasible, the amount of crude oil transported via train from the Bakken Shale through New York State would be increased significantly based

on the intended processing amounts specified by the PPL (Pilgrim Pipeline Holdings, 2016). The construction and operation of this pipeline will directly affect the communities living in proximity to these tracks in a combination of environmental disruption, perceived stressors and the possibility of physical harm or property damage should a pipeline rupture occur (McSheffrey, 2016). Furthermore, the risk of a pipeline spill is not uncommon. Annually, there are an average of 280 pipeline spills in America that USDOT qualifies as significant, based on human health, property damage, and economic effects of a spill (Conca, 2014).`ize that the significance of these spills does not account for environmental degradation (Conca, 2014). Based on these known risks of pipelines, as well as the proposed number and quantity of Crude by Rail trains known to fail, the necessity of stakeholder perception assessment prior to the New York State Department of Environmental Conservation comment period on this proposal is clear.

Locally, the train tracks studied in the 2016 capstone project, those that the trains used to supply this proposed pipeline will run on, are within a one-mile radius of Saratoga Springs hospital, 22 public schools, and Skidmore College. Trains carrying crude oil have derailed and exploded in the past, and with the significantly increased amount of oil being transported, there becomes an even greater chance of an instance of a Crude by Rail derailment and potential for spill or explosion (Liberatore, 2016).

Figure 2: Proposed Pilgrim Pipeline Route. *Source: Pilgrim Pipeline Holdings CCC (2016).*



1.1 Purpose Statement

The purpose of our research is to investigate the public perception of the Pilgrim Pipeline in Saratoga County, as well as within areas proximate to the proposed position of the pipeline, and related increased shipments of crude oil by rail through Saratoga County and New York State. We work to determine the extent to which community members are aware of the issues and reasons why they oppose or support the pipeline construction. A secondary purpose is to

better understand the attitude and efforts being made by community influentials either in favor or in opposition of the proposed pipeline and increased shipments of crude by rail. Our sample populations included Albany, Bethlehem, Rosendale, and Saratoga County. Our methods incorporated interviews, surveys, reviewing of public comments, case studies, and GIS mapping. Through this process we are guided by three broader research questions:

1. To what extent are stakeholders aware of and concerned about the potential hazards and impacts of the proposed Pilgrim Pipeline and the associated increase in Crude by Rail shipments through New York State?
2. What communities and ecosystems are most at risk in the event that the Pilgrim Pipeline is constructed?
3. To what extent does variability exist within counties and cities, in terms of support/opposition to the Pilgrim Pipeline proposal, and these entities' efforts to involve themselves in the public comment and political process provided by the NYSDEC? And why?

1.2 Oil Production Rise

The production of oil has continued to grow in the US because of increased efficiency and improvement of technology (Clemente, 2016). Although there is a boom in oil production, prices in 2016 declined by 30% (Clemente, 2016). According to the U.S. Energy Information Administration (EIA), in 2015, U.S. crude oil production averaged around 9.4 million barrels per day (Energy Information Administration, 2016). Because of the increased production of oil and the lack of access to pipelines, there has been an increase in transportation of crude oil by rail.

However, the Association of American Railroads has stated that because of the increased amount of crude oil being transported by rail, new regulations have been put in place to improve the operations (Association of American Railroads, 2016). Since the implementation of the new

regulations, the number of freight train derailments is at an all-time low and only one percent of the derailments involves crude oil (Association of American Railroads, 2016). The Pipeline and Hazardous Materials Safety Administration and Federal Railroad Administration have developed a new ruling that focuses on safety improvements that will prevent accidents, mitigate consequences in the event of an accident, and support emergency response (U.S. Department of Transportation, 2015). The new rule requires updates to all old DOT 111 cars, as well as implementing a new, enhanced tank car standard (U.S. Department of Transportation, 2015). In order to prevent accidents, the ruling requires DOT 111 produced before 2011 to acquire a new braking system that will offer a superior level of safety (U.S. Department of Transportation, 2015). As a way to prevent derailments or collisions, the ruling requires trains transporting large volumes of flammable liquids to follow new operational protocols, such as speed restrictions of 50 m.p.h. in all areas and 40 m.p.h. in high threat urban areas for any tank cars that do not meet the enhanced tank car standards, and routing requirements (U.S. Department of Transportation, 2015). There are a total of 300,000 DOT-111's in the North American fleet (DOT Reader, 2016). So far, 225 tank cars have been retrofitted in the past year and at that rate, it is estimated that it takes around 500 years to retrofit the entire fleet of DOT-111s (Milkula, 2016).

1.3 Pilgrim Pipeline Proposal

Pilgrim Pipeline Holdings, LLC. (PPH) claims that the Northeast is one of the last remaining regions without a pipeline in place (Pilgrim Pipeline Holdings, 2016). The company states that this poses increased risk of supply variability or shortage in the case of unforeseen or natural disasters. PPH thus argues that this pipeline will provide a more stable supply of oil, and furthermore that this pipeline will provide an environmentally beneficial alternative to the current system of transporting oil North and South via rail and barge. The reasoning behind this

claim is that the EPA's by-volume estimate of greenhouse gas emissions by the proposed pipeline is about 20% lower than the emissions level from using trains and barges (Pilgrim Pipeline Holdings, 2016). This being said, the possibility of quadrupling of the total oil transport via rail to Albany makes this argument somewhat moot. The company also argues that pipelines are the safest way to transport liquids, and that barges are seven times more likely to spill than pipelines (Pilgrim Pipeline Holdings, 2016). The discrepancy between this information and that of other informed sources (who?) provides a clear indication that there is a need for more research on this topic, especially regarding the communities and environments that will be directly affected should anything go awry in the transport of Bakken crude oil through this region, as well as within areas of similar circumstance.

1.4 Policy

Proposed natural gas pipelines must go through a siting review process under the Natural Gas Act (NGA) and requires approval from the Federal Energy Regulatory Committee (FERC). For proposed crude oil pipelines, however, there is no federal law that establishes a specific approval process (Murrill, 2016). When these crude oil pipelines cross states, as the Pilgrim Pipeline would, the pipeline companies must obtain approval of the pipeline route state-by-state. Additionally, no federal law exists that gives a federal agency responsibility for coordination of federal authorizations necessary for these pipelines, or setting deadlines (Murrill, 2016).

The DOT is authorized to set and enforce pipeline safety standards. Under the Supremacy Clause of the U.S. Constitution, states do not have the authority to adopt more stringent safety standards for interstate pipeline transportation unless the DOT has authorized the state to enforce these safety standards and if the standards are consistent with the minimum

federal standards (Murrill, 2016). Therefore, if the Pilgrim Pipeline were to be approved by NYSDEC, New York State would not have the ability to adopt stricter safety standards than the DOT already mandates.

2.0 Literature Review

2.1 Crude Oil Transportation

Due to the increase in crude production from Canada and North Dakota, North America has been experiencing a crude oil supply boom. With the increasing supply of crude oil, the industry has had to also increase the number of rail cars that are transporting oil (Frittelli, 2014). Many of the refineries cannot be reached by barge and the capacity of the existing pipelines are insufficient for the increased volumes (Frittelli, 2014). Therefore, the industry is required to utilize more rail cars that will transport volatile oil. According to rail industry officials, in 2013, the U.S. rail freights delivered 435,560 carloads of crude oil, which is about 300 million barrels of oil being transported by railways (Frittelli, 2014). Unfortunately, there have been some devastating derailments that involved crude oil trains, such as the explosion in Lac Megantic, Quebec and the derailment in Casselton, North Dakota, both in 2013 (Frittelli, 2014).

Although there has been an increase in oil being transported from Canada and North Dakota, a majority of the refineries are located on the Gulf Coast (Frittelli, 2014). Over the last decade, the operable capacity of a U.S. oil refinery has increased from 16.5 million to around 18 million barrels per day (Frittelli, 2014). The reason for needing so many refineries in the U.S. (115 refineries) is because refineries can only operate efficiently with a certain grade or blend of crude oils (Frittelli, 2014). Therefore, if the refinery is designed to process light crude oil, it would not be able to switch to heavy crude oil without redesigning the system (Frittelli, 2014). The increased volume of oil coming from the Bakken Shale formation, historically light, put a

strain on refineries and pipelines, which caused the price of the oil from the Bakken Shale formation to be cheaper than other crude oils traded in the U.S. market (Frittelli, 2014). Transporting oil by pipeline has been found to cost less than shipment by rail, but with the existing pipelines, it has become necessary for oil companies to increase the shipment of oil by rail cars because of the strain the increased oil has placed on the pipelines. Therefore, the construction of the proposed Keystone XL pipeline would have decreased the necessity to use the rail system for oil transportation and would have cost the refineries less money (Frittelli, 2014). Crude oil transport by rail may not continue to be a necessity, especially if pipelines are created that connect the oil from the Bakken Shale formation to the refineries (Frittelli, 2014).

With the increasing number of rail cars transporting oil, the chance for a spill or a derailment also increases. According to Frittelli, the location of the spill matters more than the volume because clean up costs will be higher if the spill was located in an area that was highly populated or had a sensitive ecosystem (Frittelli, 2014). The trains hold large amounts of potentially environmentally harmful and flammable material that would cause a vast explosion if a derailment were to occur (Frittelli, 2014). As discussed earlier, the rail cars that are used to transport crude oil are called DOT-111, which is a non-pressurized rail tank car (DOT-111, 2016). There are many reasons as to why these rail tanks prove to be unsafe, but a major problem is the thin skin of the car, which can easily be ruptured in a derailment (DOT-111, 2016). After Federal regulators announced that the DOT-111 rail tanks needed to be retrofitted, the American Petroleum Institute claimed that 10 years would not be enough time to get the work done, as 100,000 cars are in need of retrofitting (Mikulka, 2016). After seeing a rise in derailments, citizens and government officials claim that the additional chemicals added during the fracking process are to blame (Burgess, 2014). It has been discovered that one of the chemicals that is

injected into the wells is hydrochloric acid, which is a highly corrosive substance and potentially detrimental to the integrity of the DOT-111 walls (Burgess, 2014). It has also been noted that there is an increasing number of tanker cars that have suffered damage to the interior surfaces after transporting the light crude, also known as Bakken crude (Burgess, 2014). The DOT-111 cars already have thin skins, so mixing that with the hydrochloric acid may be causing a greater chance of rupturing if there was to be a derailment. Another reason that there may be a greater chance of explosion if there is a derailment is the chemical makeup of crude oil that is being transported from the Bakken Shale formation (Place, 2014). The oil that is found has a higher level of VOCs because the oil is trapped between layers of shale rock that has no outcropping that would allow any of the volatile compounds to escape (Place, 2014). Therefore, there are many reasons as to why there may be an increase in explosions of rail cars when there is a derailment.

2.2 Case Study of Lac Megantic, Quebec and Risks of Crude Oil by Rail Shipment

In July 2013, a train carrying crude oil from North Dakota derailed in Lac Megantic, Quebec. This disaster caused multiple train cars to explode and killed 47 people. Since this disaster, five more derailment accidents have occurred in Canada and the US. The reasons for this catastrophe are due to a number of factors, including human error and degraded rail infrastructure. A 2013 Federal Report by the Government Accountability Office (GAO) shows that only 1% of railroad infrastructure in the US is inspected by the Federal Railroad Administration (FRA) every year (Christopherson, 2014). This is because the FRA is understaffed and has reactive responsibilities such as performing safety checks, rather than proactive responsibilities, such as developing and implementing performance-oriented regulation. This hinders the effective management of the risk factors that may cause crude by

rail disaster. State and local government involvement is limited by the "railroad exception," which means that the FRA holds the sole ability to regulate railroads and all effort made at the state or local level to regulate railroad operations, practices, or infrastructure is preempted (Christopherson, 2014). However, inspections by state representatives in New York has bolstered inspection efforts and expedited infrastructure repairs.

The three main risks of a train derailment are landslide risks, waterside risks, and transshipment site risks, which can be caused by infrastructure or context. Infrastructure risks that lead to a crude by rail disaster included using unsafe tank cars that were not fit to carry the volatile crude oil from the Bakken Shale Formation. The DOT warned the public and shippers about the volatility of this oil and the National Transportation Safety Board (NTSB) had also warned that the metal of the DOT-111 tankers is easily punctured. However, new cars remain unavailable, so these cars still remain in use, including cars traveling through New York State.

Another infrastructure risk is the volume of hazardous substances being carried by these trains. Each tank car has a capacity of 34,500 gallons, with 80-120 tankers per train (Christopherson 2014). This massive amount of weight can cause deterioration of train tracks, especially in weather conditions of northern areas, and it is possible that the weight of the trains may actually exceed the legal limit (Christopherson, 2014). Lastly, train crossings can result in a crude by rail incident. Mile long oil trains take about 45 minutes to pass, and impatience and trespassing are already major issues. If these trains were to decrease speed because of increased safety measures, these instances may become more frequent.

Contextual risks of crude by rail shipment include routes through highly populated areas. In the transshipment site in Albany, the DOT 111 cars carrying crude oil have little security measures protecting them for up to 20 hours before being unloaded, and lie in close

proximity to businesses, homes and highways (Christopher, 2014). Rerouting the trains may be difficult because of factors such as track condition and crossings used to make routing decisions. These locations tend to be in lower-income areas, like next to the Ezra Prentence housing complex in Albany. Additionally, in the event of a spill, critical water resources such as the Hudson River and the Great Lakes may be subject to contamination without an Environmental Impact Statement (EIS) because of federal preemption of railroad routing and safety regulation.

If an accident does occur, the railroad company is responsible for clean-up efforts, but the quality of those oil recovering efforts is limited. For example, in 2013, a 90-car train carrying 2.7 million gallons of crude oil from North Dakota's Bakken shale formation derailed and exploded in Alabama, spilling nearly 750,000 gallons of crude into wetlands (Sturgis, 2014). The community of Aliceville, where the disaster occurred, is a poor community with the 66 percent of the population African-American and 44.7 percent of residents living in poverty (Sturgis, 2014). The Alabama Department of Environmental Management assured that no oil was released into the wetlands and that they were working hard on recovery and successfully cleaning up the spill. Nevertheless, 9 weeks after the spill conditions showed large pools of black crude oil floating on top of the water and oil seeping from the soil on the edge of the water (Sturgis, 2014). Inadequate cleanups like in Aliceville, Alabama are partly due to the fact that many of these railroad companies simply do not have the funds to pay for a large disaster. The railroad company responsible for the explosion in Lac Megantic, Montreal, the Maine and Atlantic Railway (MMA,) filed for bankruptcy, and saddling the public sector with millions of dollars of liability. Lastly, there always remains the chance that someone may attempt to purposefully

sabotage cars and/or infrastructure near cities or waterways in order to cause harm to humans and the environment through which these rail cars are traveling (Christopher, 2014).

2.3 Case study of The Social and Mental Health Effects of the Exxon Valdez and BP Deepwater Horizon Historic Oil Spills

Oil spills are known to have vast and lasting environmental effects, which in turn cause and contribute to social and mental health problems within proximate communities. The paper "The Exxon Valdez and BP Oil Spills: A Comparison of Initial Social and Psychological Impacts" examines the social and mental health responses of the affected community members regarding the two largest North American oil spills in history, these being the Exxon Valdez barge spill of 1989 and the 2010 BP Deepwater Horizon spill and explosion (Gill et al., 2012). The authors use mental health impacts over time to understand the relationship between level of impact and social factors, and in turn use this information to examine future implications for the affected communities.

The Exxon Valdez oil spill occurred as a result of the failure of the Exxon Valdez supertanker. This ship ran aground on a reef within the Prince William Sound in Alaska, where it proceeded to spill more than 11 million gallons of crude oil into the sound, creating a vast oil slick (Gill et al., 2012). This oil slick had extreme ecological and social impacts, as it contaminated (of land or of water?) a44,000 km^2, thus destroying one of America's most profitable seafood ports (Gill et al., 2012). Human life was not lost in this incident.

The BP oil spill occurred in April of 2010, when the Deepwater Horizon rig in the Gulf of Mexico exploded, breaking the wellhead and killing 11 workers. The broken wellhead proceeded to leak about 55,000 barrels of crude oil daily, allowing a total of approximately 205 million gallons of oil to escape into the ocean (Gill et al., 2012). Both spills had extreme

environmental impacts, which in turn resulted in a variety of social impacts, some of which continue to affect both regions to this day (Gill et al., 2012).

In terms of social response, oil spills produce varying levels of community member vulnerability due to resource damage or destruction during the spill and cleanup processes (Gill et al., 2012). Authors measured vulnerability in order to understand psychological stress levels, where vulnerability is a product of physical proximity and location, social class, and other demographic information (Gill et al., 2012). Specifically, survey questions regarding demographics were followed by questions considering direct exposure to oil, resource utilization and loss, and perception of risk and recurrence (Gill et al., 2012). This information was gathered using telephone surveys which produced a somewhat economically varied demographic of a total of 412 respondents; 9 out of 10 of which identified as white, providing a predominantly racially homogenous sample group. This being said, authors concluded that those that identified as non-white showed an overall trend of significantly higher stress related (mixed methods or surveys and stats?) to the spills than those that identified as white (Gill et al., 2012). A five point Likert scale was used to assess responses to questions such as "How would you describe the overall economic impact of the oil spill on your household?"

The overall findings of their research revealed that an individual's stress response to the BP oil spill were tied to factors such as family health, and economic losses, especially concerning ecological dependency, and direct contact with oil. Related studies found consistent evidence of higher health effects among low-income community members. Broadly, respondents in the Gulf Coast area affected by the BP spill showed a degradation of mental health following the spill, especially related to economic uncertainty. The Exxon Valdez spill provides a longer term body of research, which showed prolonged stress responses, namely depression, that lasted

over an 11-year period in some cases, specifically among fishermen and those that rely directly on the local ecosystems for economic stability. These findings revealed the lasting effects of oil transportation failure on societal health and economic systems.

The relevance of this study in context to the Pilgrim Pipeline stems both from the proximity of community members to the proposed pipeline as well as local economies that depend upon the local ecology, in particular concerning the Hudson River and coastal ecology. Specifically, members of minority and low-income citizens will be at a higher risk of stress, due to their proximity and exposure to crude oil contamination, resource damage or destruction, should the pipeline fail. These factors all contribute to heightened levels of stress responses such as depression, and anxiety among affected people, which is shown to outlast the reparable effects of a spill. In order to protect marginalized groups from these stressors, which are shown to degrade quality of life, the level of risk perception among at risk, both high and low income, communities must be evaluated.

2.4 Case Study of the Social Implications of Oil Pipeline construction in Fairbanks, Alaska

The Trans Alaska oil pipeline had extensive social, economic, and cultural effects on the small community of Fairbanks, Alaska. The book, *What Happened to Fairbanks? The effects of the Trans Alaska Oil Pipeline on the Community of Fairbanks, Alaska*, by Mim Dixon, discusses the issues associated with pipeline construction on communities and the unexpected implications, which made the negative outcomes of the construction of this pipeline far more impactful than the positive ones. While Fairbanks can be regarded as a unique situation due to the remoteness of the small community, among other unique circumstances, Dixon believes that this example offers important empirical information for towns housing future oil pipeline projects.

The Trans Alaska oil pipeline is an 800-mile pipeline that was built between 1974 and 1977, spanning from Prudhoe Bay to Valdez (Dixon, 1978). Initially, the social impacts of the pipeline, aside from the potential for a spill, were assumed to be positive. Especially the creation of jobs, the supply of oil to energy starved portions of the country, reduced reliance on foreign oil, which were perceived to result in increased economic stability and greater state tax revenues, which would in turn provide for more public services (Dixon, 1978). Instead, the social impacts proved disproportionately negative to the town.

Fairbanks was effected by a culmination of factors including lack of community involvement in the planning process, massive migration of workers to fill the 50% of jobs not filled by Alaskans, and lack of industry involvement in ensuring their access to amenities. These factors resulted in housing crises, infrastructure degradation, and negative social impacts including rising rates of street fighting, assault, prostitution, degraded familial cohesion, and economic inflation, all of which exacerbated the small town's ability to cope with this three-year long project. In closing, Dixon suggests that municipalities housing pipeline projects in the future need to be better counseled and involved in the planning process and should require at least one year of town preparation for the influx of newcomers and infrastructure prior to the beginning of construction (1978).

Furthermore, Dixon notes that environmental impact statements must include stipulations on how any resulting issues will be handled at the local, state, and federal levels, as well as how and for what the involved industry will assume responsibility (1978). The issues associated specifically with the industry highlighted within the book include housing in regard to industry provision, highway repairs as a result of degradation associated with industry traffic, industry covering costs associated with necessary infrastructural updates, and employment restrictions

(Dixon, 1978). Other issues included necessity for industrial alcoholism to improve public safety, need for carpooling to reduce air pollution and traffic, and necessity for compensation of over utilized local volunteer groups, and employee childcare to allow more women to participate in the construction effort. This issue was especially prominent in that the employment of more local women would help to reduce the influx of outsiders from which so many of the maladies faced by Fairbanks stem. Overall, Dixon expressed a resounding lack of inclusion of the Fairbanks community in the planning process, a lack of industry supports for the town, and a general degradation of community as a result of the construction of the Trans Alaska pipeline (Dixon, 1978). Dixon suggests that the effects of some of these factors could be reduced or negated with more extensive planning, a redefined EIS, and more state, federal, and industrial input, and that all of these factors should be considered and instituted to the extent possible before permitting or beginning a future pipeline project in order to ensure that other communities do not face the adverse effects of pipeline construction that Fairbanks did.

3.0 Methods

3.1 Population and Setting

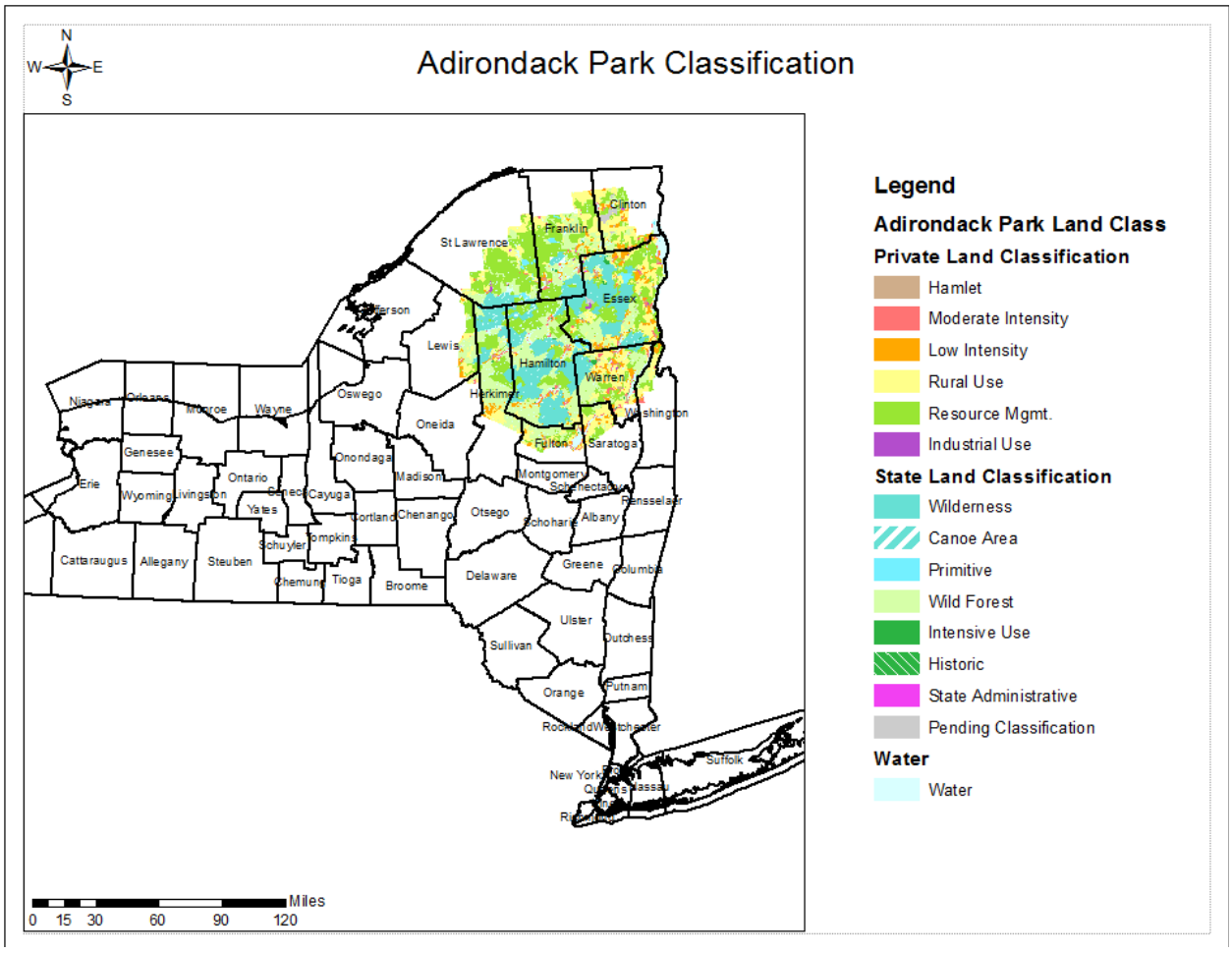
Our research focuses on community influentials' perceived risk associated with the transportation of Crude Oil by rail as well as the proposed Pilgrim Pipeline, and the prevalence and explanation of actions taken by these individuals. Our study boundary includes communities and counties along the Canadian-Pacific and the CSX rail lines, and the proposed Pipeline through New York and New Jersey. This study is focused primarily on the responses of state legislators and community influentials in relation to action, inaction, interest, perceptions, knowledge, and attitude about oil transportation through or near their communities.

According to U.S. census data (2010), the population of New York State is 19.4 million people. About 70.1 percent of NYS residents are white, 18.8 percent are Latin American and 17.6 percent are African American. 85.4 percent of NYS residents have a High School degree, and 33.7 percent have a Bachelor's degree. The average weekly wage is $1,180, and median household income is $58,687 (United States Census Bureau, 2016).

Environmentally, New York State is home to a diversity of flora and fauna biodiversity separated into seven main systems for classification: marine systems, riverine systems, lacustrine systems, and subterranean systems refer to predominantly fauna dominated systems, while estuarine systems, palustrine systems and terrestrial systems refer to flora biodiversity (Edinger, 2014). These systems and the diverse plant and animal interactions they describe are vital to New York State, and must therefore be considered in the setting of this study.

New York State is also home to the Adirondack Park, which was created in 1892 (The Adirondack Park, 2016). The Adirondack Park incorporates 6.0 million acres of waterways, boreal forests, and immense mountains, all of which comprise the largest park in the lower 48 states (The Adirondack Park, 2016; ADA, 2016). The Adirondack Forest Preserve was established in 1894, which recognized the forest as a constitutionally protected Forever Wild area (The Adirondack Park, 2016). Of the total six million acres of the Adirondack Park, 2.6 million acres are owned by New York State and the remaining 3.4 million acres are privately owned (The Adirondack Park, 2016).

Figure 3: Classification of Adirondack Park



New York State has the third-largest economy in the United States (Ross, 2016). New York City is a global leader in banking, finance, and communication jobs (Ross, 2016; Kotkin, 2014).

Our study is focused around the New York State Capital Region, which is located in the eastern part of mid-New York State, covering 5,199 square miles. Population of the Capital Region is about 1.1 million as of 2009 and consists of 8 counties; Albany, Columbia, Greene, Rensselaer, Saratoga, Warren, and Washington. Per capita income for this area is about $28,644, with 568,600 currently employed (Empire State Development, 2016). The Hudson River is a defining characteristic of the Capital Region, as well as our study site. The Hudson River runs

south from the Adirondack Park through the eastern part of NYS to New York City. The New York State Thruway and Northway (I-87) connect the Capital Region from Montreal with NYC, the Massachusetts Turnpike (I-90), and Western NY.

3.2 Instrumentation and Data Collection

This qualitative research utilized "purposive" sampling (Creswell, 1994), employing semi-structured interviews with community influentials: municipal, state, and federal governmental elected officials, board members of non-profit organizations, and business members. Three interviews were conducted in-person and 11 through phone conversations. We recorded interviews using cell phones and a recording application called Voice Memos. Two of the research members took notes during the interviews, while the third focused on asking the interview questions. The average length of each interview was 30 minutes, with the longest being an hour and shortest 20 minutes (Appendix 1).

To ensure respondent consent, each respondent signed an informed consent form from the Skidmore College Institutional Review Board (IRB) which describes the previous work on this topic as well as the parameters of this research effort. This protocol, titled "Crude by Rail: Oil Transportation Safety in Saratoga County," was granted on November 30, 2016. Each respondent received a copy of this letter accompanied by a Skidmore College Informed Consent Form, which ensures participant privacy, confidentiality, and anonymity unless specific permission has been granted to publish their name and affiliation. The consent form informs the respondent of the general parameters of this study, as well as their right to withdraw from, or cancel the interview at any point, without the risk of damaging relations with Skidmore College and associated representatives.

3.3 Geographical Information Systems Data Collection

To triangulate our methods (Creswell, 1994) we used ArcMap to visually describe environmental and social information in the vicinity of the proposed pipeline and existing rail lines. Data included school zones, watersheds, wetlands, endangered species, critical habitat, counties, towns, census data, public lands, and town opinion on the pipeline. The GIS report compared the blast zones of current railways, the increased rail traffic and the Pilgrim Pipeline. We incorporated information from ArcGis online, New Jersey Office of GIS Open Data, Aberdeen, Carolina & Western, State of New Jersey Department of Environmental Protection: Bureau of GIS, U.S. Fish & Wildlife Service National Wetlands Inventory, and USGS Geospatial Data Gateway.

The use of GIS is beneficial because it allowed us and the readers to visualize our research findings. Through Skidmore College, we utilized the GIS Lab in order to use ArcMap. We received help from Tom Hart, the GIS Professor at Skidmore College.

3.4 Data Analysis and Limitations

Geographical Information Systems Results Limitations

To produce a GIS map, one needs to download information from a plethora of websites. The coordinate systems of each layer need to match up, which can pose a problem for the end results if the coordinate systems are incorrectly projected. We wanted to create a map that would compare the overall county party affiliations with the county opinions regarding the construction of the Pilgrim Pipeline. After the 2016 election, the change in county assembly members acted as a major limitation we faced because we had to manually create a layer that included the current information. Since we are using a large quantity of data, figuring out a cohesive and effective

layout for our maps was another limitation that we have faced because you do not want the maps to be overwhelming to the audience.

Interview Results Limitations

Due to time restraints, we will be unable to drive to all of the towns along the rail lines or proposed pipeline route to collect data, thus limiting the regional diversity of face-to-face interviews with respondents. Because our data collection consists mainly of interviews, we will have a data set consisting of fewer individuals than if we were to use surveys due to time constraints, necessary planning time, travel, and potentially respondent willingness. This is compounded by lack of funding, which affects our ability to travel to conduct the large number of face-to-face interviews we had originally intended. Furthermore, because our study area reaches beyond the towns directly surrounding Saratoga Springs, more time, planning, and capital are required for the longer commutes we are able to make. The unpredictability of winter weather in this region is also an inhibitor to our ability to travel to interviews with important stakeholders.

4.0 Findings

4.1 Semi-Structured Interview Data

We conducted semi-structured interviews with 14 influential community members, or people we believe are able to influence policies, emergency response planning, and regulations, including elected officials, non-profit organizations, and members of state government (Table 1).

Table 1: *Community Influential Semi-Structured Interview Participants*

Name	Title	Affiliation
Andy Bicking	Director of Public Policy	Scenic Hudson
Bill Boehmke	Chair, Climate & Energy Committee	Sustainable Saratoga
Jennifer Metzger	Councilwoman Director	Town of Rosendale, NY Citizens for Local Power
Jeremy Cherson	Campaign Advocacy Coordinator	Riverkeeper
Sue Rosenberg	Founder	CAPP-NY (Coalition Against Pilgrim Pipeline-NY)
Jim Quigley	Town Supervisor	Town of Ulster, NY
Mary Ellen Ryall	Published Author	Saratoga Springs, NY
Rebecca Martin	Co-founder	Kingston Citizens
Dr. Stephen Shafer	Resident/ Self proclaimed "Traffic Analyst" for barges over the Hudson River	Town of Saugerties, NY
Paul Nathanson	Media Representative	Pilgrim Pipeline Holdings, LLC
George Green	Town Supervisor	Town of New Windsor
Kevin Cahill	Assemblyman	Kingston
Chris Mathiesen	Chief Commissioner of Public Safety	Saratoga Springs, NY
Paul Tonko	Congressman	New York

4.2 Involvement and Awareness of Crude Oil Transport via Rail and the Proposed Pilgrim Pipeline

All of the influential community members we interviewed were aware of the crude oil transport via rail through New York State and the Pilgrim Pipeline proposal and some of our respondents learned about the issue from other respondents:

> It would have gone back to whenever the company filed… I think it was probably about 2 years ago now where we first were paying attention to the pipeline. The bomb trains goes back a little bit further than that, I would say probably a little more than 2-3 years ago (*A. Bicking, personal communication, 2017*).
>
> When the issue first emerged on our radar in NY, I just happened to be contacted by some residents that were contacted by the company for surveys on their properties, and they were very upset. And that's basically how I got involved and did some research and made it a public issue (*J. Metzger, personal communication, 2017*).
>
> I think it was October 2015, there was a meeting at New Paltz and it was a presentation about Pilgrim Pipeline, which I had known about, but only a little bit. I had been involved in the fight against fracking in New York and in other national struggles against oil and gas pipelines. But at that time, Jen Metzger and some other people presented the proposal for the pipelines to be built *(S. Rosenberg, personal communication, 2017*).
>
> The Pilgrim Pipeline company had engaged a group of surveyors to do a right-away survey, and probably within 24 hours of those individuals appearing at the homes and businesses up and down the route, the supervisor's office was contacted and asked what was going on (*J. Quigley, personal communication, 2017*).
>
> Riverkeeper got involved in the Bomb Train issue in 2011 when we started noticing the black cars rolling down the west shore of the Hudson and started looking into some of the

> risks and the type of oil that was moving in the tank cars….With Pilgrim, that proposal I believe came to people's attention in late 2013, early 2014, and the first action we took was a town councilwoman in the town of Rosendale Jennifer Metzger… wrote a white paper about the proposal, the risks it posed, who was proposing it and we held a community forum at SUNY New Paltz that was packed, and that kind of kicked off our engagement in Pilgrim (*J. Cherson, personal communication, 2017*).
>
> So I'm on the board for Sustainable Saratoga and the chair of the climate and energy committee, and we received an email from Dr. Steven Shafer, who's a retired physician in Saugerties, NY, which is just below Albany... So he sent an email… and this was probably a year and a half ago maybe... just indicating his concern that he's been in touch with communities and indicated that he wanted action and that he knew we could take what's called the scoping procedure. And so he's been sending me information and emails about this procedure and I replied and have been in touch with him in learning about the procedure (*B. Boehmke, personal communication, 2017*).

Additionally, all but two of our respondents have taken a stance as well as been involved with the Pilgrim Pipeline proposal. Jim Quigley, Supervisor for the Town of Ulster, has addressed safety concerns with oil trains but not with the Pilgrim Pipeline, partly because Ulster has a policy on not doing memorializing resolutions, and largely because he believes the Pilgrim Pipeline project is dead:

> As it relates to the pipeline, the town has not been presented with any factual documents documenting the risks relating to the pipeline by any part, other than a routemap. The town has done independent research of public materials as it relates to the citing of specific facilities related to the pipeline and has formulated a response but at the present

time, based on our knowledge, we believe the pipeline is dead. We're not going to waste any time on it (*J. Quigley, personal communication, 2017*).

Congressman Paul Tonko, although agreeing that there are safety concerns with pipeline and fossil fuel infrastructure and acknowledging that some pipelines that are dirty should not be allowed, did not take any stance on the proposed pipeline:

> With some of the pipelines, especially for the dirtiest, toughest to refine oil, I am opposed to that. If we can address the safety: there should be a checklist, and when it's completed, then a green light. They're tough issues. (*P. Tonko, personal communication, 2017*).

Figure 4: *Connected Activism Between Stakeholders*

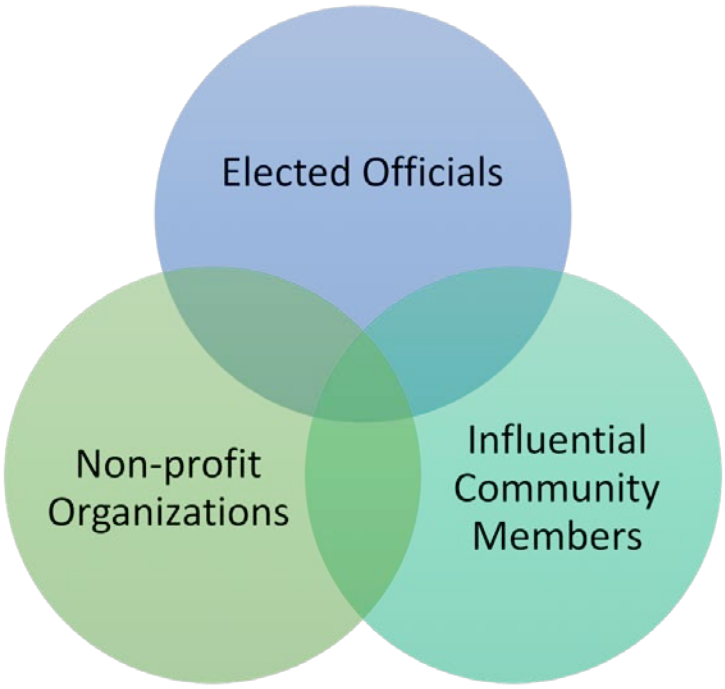


Figure 4 shows the relationship between three groups of stakeholders: elected officials, non-profit organizations, and influential community members. We found that many of the stakeholders worked together on events, such as the town meetings. During an educational

meeting in Kingston, New York, we saw elected officials, non-profit organizations, and influential community members speak on the potential impacts of the proposed Pilgrim Pipeline.

We asked our respondents their three primary concerns regarding the Pilgrim Pipeline and associated increase of crude oil trains out of a list of eight possibilities: water, environmental degradation and pollution, human health and safety, human rights, economics, public and private land, oil reliance, and potential for disaster. Out of these options, water and environmental degradation and pollution were the top two concerns, listed by eight and seven respondents respectively. Human health and safety, economics, and potential for disaster were also listed by a significant portion of respondents, as each category was listed by five respondents (more than ⅓ of our total respondent pool). Oil reliance was listed by four respondents, and came up in conversation with the majority of our respondents. Finally, public and private lands and human rights were each listed by one respondent (Figure 5).

Figure 5: *Bar chart illustrating respondents' highest concerns regarding the Pilgrim Pipeline*

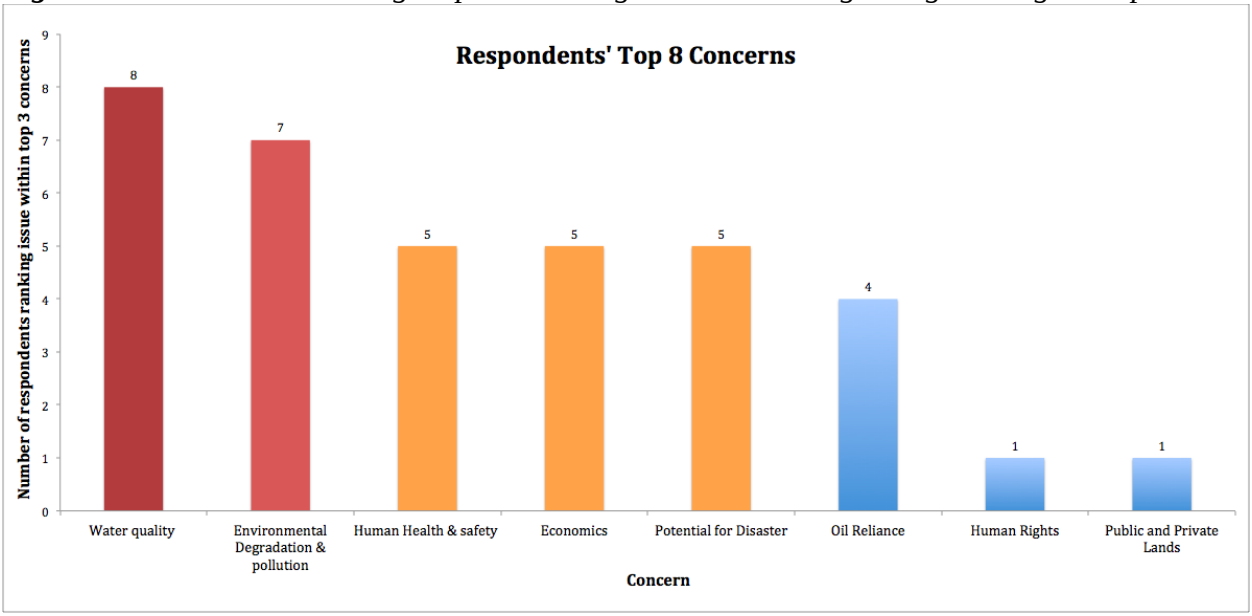


Figure 5 shows the overarching importance of water quality to respondents. While multiple respondents noted the interconnectedness of many of these categories, environmental degradation and human health joined water among the top three highest areas of concern for respondents.

Table 2: *respondent's top concerns by affiliation type (i.e. elected official, not-for-profit organization, community influential)*

Name	Title	Affiliation	Affiliation type	Top Concerns
Elected Officials				
	Councilwoman	Town of Rosendale, NY	Elected official	Water, human health, environmental degradation
	Director	Citizens for Local Power	Non-for-profit organization	
George Green	Town Supervisor	Town of New Windsor, Orange County, NY	Elected Official	Water, potential for disaster
Paul Tonko	Congressman	New York	Elected Official	Human health and safety, reliance on oil
Kevin Cahill	Assemblymember for the 103rd district	New York	Elected Official	Environmental degradation and pollution, water quality, economy
Chris Mathiesen	Commissioner of public safety	Saratoga Springs, NY	Elected Official	Potential for disaster, economics, environmental degradation and pollution
Jim Quigley	Town Supervisor	Town of Ulster, NY	Elected Official	Economy
Board members of nonprofit organizations				

Sue Rosenberg	Founder	CAPP-NY (Coalition Against Pilgrim Pipeline-NY)	Not-for-profit organization	Environmental degradation, human health, Water
Andy Bicking	Director of Public Policy	Scenic Hudson	Not-for-profit organization	Public lands, water, potential for disaster
Jeremy Cherson	Campaign Advocacy Coordinator	Riverkeeper	Not-for-profit organization	Water, environmental degradation, oil dependance
Bill Boehmke	Chair, Climate & Energy Committee	Sustainable Saratoga	Not-for-profit organization	Human health and safety, dependance on oil
Influential community members				
Mary Ellen Ryall	Published Author	Saratoga Springs, NY	Community influential	Water, environmental degradation, human rights
Rebecca Martin	Co-founder	Kingston Citizens	Non-for-profit organization	Water, human health, environmental degradation
Dr. Stephen Shafer	Resident/ Self proclaimed "Traffic Analyst" for barges over the Hudson River	Town of Saugerties, NY	Community influential	Oil reliance, economy, human health

Many of these top concerns contained overlap in why our respondents chose them. For example, many or our respondents connected water quality with environmental degradation. As a result, we were able to extrapolate six main themes of concern: environmental impacts of pipelines and associated increase in oil trains, demand to transition towards renewables, necessity for education about fossil fuel infrastructure, activism and whiplash effect in response to the Dakota Access Pipeline (DAPL) and the Keystone XL Pipeline, public health and safety and environmental justice concerns, and negative economic impacts.

4.3 Environmental Impacts of Pipelines and Associated Increase in Oil Trains

Seven of our respondents cited environmental impacts as a major concern with the Pilgrim Pipeline and increased oil trains, and all of our respondents spoke about water, mainly the Hudson River, as a concern. Respondents often linked water impacts with environmental concerns as shown below:

> Well they're all very important and obviously we have to look at the impact cumulatively, but I would say that the one single thing is from our mission standpoint is the impact on the Hudson River itself, so the transects that could be running to the waterfront and then the crossovers up in the port of Albany probably have the most direct impact on the river (*A. Bicking, personal communication, 2017*).

> The reason why we're involved is because it's proposed to cross the Hudson River twice in Albany, and then when it's traveling along the west side or traversing the west side of the Hudson River Valley, it crosses major tributaries that we've been doing major work in like Catskill Creek, the Wallkill River, Sawkill Creek, the Esopus Creek and Rondout Creek, which are all major systems of the river in the mid-Hudson and any potential spill in those waterways would be devastating. In addition, the DEC notes that it would impact almost 300 wetlands, which are critical and rare these days and provide a lot of benefit such as water purity, wildlife habitat, help water seep into the water table that a lot of communities use for their drinking water (*J. Cherson, personal communication, 2017*).

> I'm most against pipelines and water. You can't make water. There is only so much allotted to the earth. And you need to keep it clean in order to drink it, to grow your crops, to take care of all the animals and nature and everything… It's not just about me.

> I'm part of the group that is leaving. We want to preserve the earth so that it is a gift to the next generation. That's what our ancestors did. And mind you, it is going to be the next war at some point. Maybe not my lifetime and maybe not in yours, but that's how priceless water is. You cannot have a life without it. Not even a tree can breathe without it (*M. E. Ryall, personal communication, 2017*).
>
> Some of the the biggest concerns have to do with the water quality impacts. Both groundwater and surface water impacts. It would cross through Rosendale, our town, but we're not unusual in this regard. In most rural towns, most people get their drinking water supply from wells fed by groundwater. There are some communities out here, for instance, the town of Esopus, Redhook, and Rhinebeck, that get their water from the Hudson River, and they have concerns about it because the Pilgrim Pipeline crosses the Hudson River in two places, as well as crossing all of the major tributaries to the Hudson. The connections to drinking water - both surface water and groundwater- are huge concerns (*J. Metzger, personal communication, 2017*).

4.4 Demand to Transition Towards Renewables

Five of our respondents spoke in depth about the need to transition toward a renewable energy system. The current New York State Energy Plan for 2030 has set a goal to source 50% of the state's energy from renewable sources by 2030, and a 40% reduction in greenhouse gas emissions (NYSERDA, 2016):

> We need to move from our reliance on fossil fuels to renewables. Building a pipeline, making such an investment, we almost guarantee that less of an investment will be made in the push towards conservation and renewables (*S. Rosenberg, personal communication, 2017*).

> Personally, I think that a better path for us to take would be begin to make it easier, make it more convenient, make it more economic for people to use renewable resources and to begin the process of seriously weaning ourselves off of all forms of fossil fuel, including natural gas, which is another controversial form of fuel that is often spouted as cleaner than oil (*K. Cahill, personal communication, 2017*).

> They still haven't submitted… or the current [Draft EIS] hasn't been submitted or accepted yet. So as far as I'm concerned the longer it takes the better it is because the longer it's put off the more renewables get grown and makes it more expensive for the company to do the process and hopefully it won't happen (*B. Boehmke, personal communication, 2016*).

When speaking with a representative from Pilgrim Pipeline Holdings LLC, he commented that although renewable energy is something we should be working towards, the transition to renewable energy from fossil fuels will take a long time:

> I think you could be for the development of renewables - wind and solar and such - and also be for strengthening our energy infrastructure at the same time. Because the fact is that we're going to be depending on fossil fuels for decades to come, so why not transport them in the safest, most environmentally friendly and most efficient way possible (*P. Nathanson, personal communication, 2017*).

4.5 Need for Education on Fossil Fuel Infrastructure

Four of our respondents specifically cited education on fossil fuel infrastructure as paramount when combating an issue like the Pilgrim Pipeline. We found that non-profit

organizations and activists took a leadership role in educating the public on the proposed pipeline:

> Education is paramount at all levels: in the grade schools, in the high schools, in the colleges, the administrators, the government. All of them have to be involved in environmental education. I think in our country, we haven't insisted that it should be part of the curriculum. And so we're raising generations of citizens who know nothing about the Earth (*M.E. Ryall, personal communication, 2017*).
>
> The other goal was to get the municipalities in Ulster County who were also involved agencies in seeker and invite them to be supporters of an educational event. Not to take a position, but to say are you supportive of this educational opportunity. And you'd be surprised at how many would not, which i think is important for the public to see (*R. Martin, personal communication, 2017*).
>
> In communities where you have not seen resolutions passed in opposition to the proposal, it's largely because the people in those communities either A. support the project or B. don't understand it or C. don't care and aren't paying attention. So a lot of our efforts have really been going out and doing the kind of education work to make sure that people have the benefit of our perspective when making up their mind or at the least have the issue raised about. We find that when that happens people are generally in support of our perspective on this (*A. Bicking, personal communication, 2017*).

4.6 Activism and Whiplash Effect in Response to the Dakota Access Pipeline (DAPL) and the Keystone XL Pipeline

Since the Dakota Access Pipeline (DAPL) and the Keystone XL Pipeline proposals have prompted national media coverage and activism, many have been inspired to be involved in other

pipeline fights like Pilgrim Pipeline. When we asked Pilgrim Pipeline Media Representative Paul Nathanson if the level of backlash from NGOs and the Resolutions of Opposition towns had passed against the pipeline were unique, he responded "I really think that in the last seven - eight- years, since the Dakota Access [Pipeline], that's the typical response by environmental groups and others" (personal communication, 2017). A total of six respondents spoke on this connection between the proposed Pilgrim Pipeline and other anti-pipeline activism, citing that the fight against Pilgrim was essentially the same fight as the DAPL and the Keystone XL pipelines:

> Obviously we're very interested [in activism against the Dakota Access Pipeline]. Their struggle is our struggle from a certain point of view and we can learn a lot from observing them (*A. Bicking, personal communication, 2017*).
>
> Our fight against pilgrim is really the same fight as not only the DAPL and other pipeline fights… but also communities impacted by uranium mining or coal ash dumping or by mountaintop removal mining. It is all the same. It is communities that get impacted and destroyed for the good of the corporations. We really have an opportunity now to change that (*S. Rosenberg, personal communication, 2017*).
>
> I think that it's all part of a common fight, and we all need to support all of these efforts and be united across the country to the best of our abilities. Of course everyone can only do what they can do given their own resources and time, but even within that there is so much we can do to support each other and the struggles that we are sharing against these projects (*J. Metzger, personal communication, 2017*).

4.7 Human Health, Public Safety, and Environmental Justice

Out of our respondents, five mentioned human health and public safety as a major concern. Specifically, our respondents commented that, although a disaster may be unlikely percentage-wise, if an accident were to occur, it would be disastrous. Even with safety measures in place, respondents remained concerned about public safety. Four of our respondents also expressed that minority and low-income communities beared the brunt of the risk:

> The fire chief out in Oregon where they had a derailment said… you know we did everything right, the train slowed down, they followed all of the regulations, they even had some of the new cars, and the train still derailed and erupted in flames and he said the foam was absolutely useless. The flames were so hot that [the foam] was useless. We had to wait until it cooled down before we could use the foam to actually douse the fire, so he said if this had happened in the middle of the town, we would just have to wait. And, I've heard this in other places as well. Even this stretch of track where it derailed had been upgraded, so it wasn't like the infrastructure was in bad shape, it was up to code and upgraded and the cars were in good shape and the operator was doing it at the safe 30 mph as it approached town. He said the additional weight of these oil cars going around a curve puts so much added torque on the lateral motion of the cars that it pops them off the rail (*B. Boehmke, personal communication, 2016*).
>
> How dare they take this crude oil down to the southern part of Albany where it is all poor people and pollute them. It's carcinogenic. So I don't know how we are allowing this to happen again. The city of Saratoga does not want to let influential people know that we have this monster on our back. They don't. It's bad PR (*M. Ryall, personal communication, 2017*).

The South End would face greater health risks from the proposal because to supply the pipeline, they would increase the throughput of oil through that facility in the South End, causing greater emissions to that community that already faces high emissions from truck traffic and from oil train operation in the port (*J. Cherson, personal communication, 2017*).

The pipeline is running mostly along the Thruway corridor. The people most likely to have the thruway going through their backyards are mostly of lower to moderate income, so it is going to have a disproportionate impact on poor to moderate working families. The supporting infrastructure that is planned - the pumping stations and all of that - that is all right smack adjacent to these communities. So it is going to have an adverse effects on them - air quality, and generally unhealthy fossil fuel infrastructure (*J. Metzger, personal communication, 2017*).

The issue with the pipeline and the low income communities in the Albany area - I know that they're very concerned about the impact of the plant that would be processing the oil before it goes into the pipeline. It's in a part of Albany that is very close to come low income housing. Again, air quality and the possibility of some type of accident because these are all volatile materials, they really are. To put a plant there, in such a heavily populated part of a city makes no sense to me whatsoever, but again it makes no sense to me in the first place (*Chris Mathiesen personal communication, 2017*).

4.8 Economic Impacts

Five of our respondents cited economic impacts as a major concern, believing it would hurt the economy, property values, and tourism of the towns near the oil cars and the proposed pipeline route. Additionally, most of our respondents believed that the pipeline would not generate any jobs or benefit to the local economy because the pipeline would only pass through the state:

> This is not a jobs versus the environment issue. There are temporary construction jobs associated with any infrastructure project. However, you really need to balance the benefit of those jobs in a short-term strategy against what the long-term benefits are of having a healthy environment and look at it holistically in terms of tourism, economy, in terms of the ability for flexible use of the Thruway right of way to facilitate commerce, in terms of the cost on the environment and public health of the risk of clean water and so on. So when you put all these things together the economic benefits of the pipeline does not seem to be supporting the public interest. It really is being driven by specific private interests (*A. Bicking, personal communication, 2017*).

> I think that it is a deterrent to our economy because we are all about health, horses, and the environment here [in Saratoga Springs]...And the people that come here, they have a concept of Saratoga as the jewel of the country. The jewel of health, vitality, organic food, all the things that are good. And how do you think that public is going to feel when they find out that guess what's coming through the backyard and nobody did anything about it? I think that could affect the future of Saratoga Springs. And all they need is one little incident to happen here and that would cut into the vibrant economy that we have … You can't have this ugly thing, that black snake that I tell you about. Keep it away… I mean don't people drive to Saratoga? Won't they see these massive lines of crude oil

trains coming through here? It's enough to make you weep (*M. Ryall, personal communication, 2017*).

I mean obviously the economic impact on a very broad level is important. It will have impacts on property owners rights, on people who live near it … and certainly if things go wrong, the economic impact will be great in communities. On a broad level, we need to move from our reliance on fossil fuels to renewables like building a pipeline, making such an investment we almost guarantee that almost less of an investment will be made in the push towards conservation and renewables… Also pipeline companies like Pilgrim and for DAPL, the energy transfer partnership, are big corporations who are making humongous fortunes off of risking our both environment and climate and the impact individually that people have when pipelines are built. The power of big corporations is another economic issue (*S. Rosenberg, personal communication, 2017*).

We know this oil that's proposed to fill the pipeline would just pass through the Hudson Valley, so to the community here it represents no economic benefit. The oil is just passing through. [Pilgrim has] argued that the pipeline would lead to 50 permanent jobs after construction, but those jobs they have with the pipeline are proposed to be monitored remotely. So you have one person, or a couple people, possibly not even in New York State, doing remote monitoring of the project, so the economic benefit in terms of employment are dubious (*J. Cherson, personal communication, 2017*).

The fossil fuel industry is a capital intensive industry, it is not labor intensive. For instance, the renewable energy sector is a labor intensive industry. [The fossil fuel industry] does nothing for the local economy. It will create some short term construction jobs, but that's it. And, in fact it can have a really negative impact on our economy to the

> extent that if there is a spill, it would have devastating effects. A lot of our economy depends on tourism and agriculture - the Hudson Valley is one of our most important sectors of agriculture. The agricultural and tourism sectors would both be really adversely affected by any kind of major spill (*J. Metzger, personal communication, 2017*).

One of our respondents, however, made a contrarian argument about the economic effects of the Pilgrim Pipeline. Though he believes the pipeline is dead, Jim Quigley criticizes environmentalists for driving out businesses, which small towns, such as Ulster, desperately need:

> When we have projects such as Niagra, such as the Pilgrim Pipeline, come to the community, and they are met with such a large amount of sensationalists, it creates an environment where no one wants to do business. If no one wants to do business, there aren't jobs in the community. If there are no jobs, nobody can live here (*J. Quigley, personal communication, 2017*).

4.9 Support for the Pilgrim Pipeline

Beyond Paul Nathanson, a representative for Pilgrim Pipeline Holdings LLC, none of our respondents have expressed support for the Pilgrim Pipeline. When asked to identify potential pipeline supporters, respondents tended to list Pilgrim Pipeline Holdings, LLC and suggest that the municipalities that had not submitted resolutions of opposition may also be for the pipeline. Of particular interest was Quigley's response, "No [I don't know of anyone]. Because they don't want to put their heads up and get shot" (*personal communication, 2017*). However, some of our respondents did provide some insight as to why this might be the case:

On a community level, those people are not nearly as visible as they used to be and in fact many of them have changed their minds when they've learned more about the proposal. The company itself is obviously supporting this the most. You have to try to reach Pilgrim Holdings and try to reach their perspective. They had hired a professional lobbying firm who was for a while handling many community meetings that were being held on this and taking notes and advocating for the company position. I have not seen those individuals out at the meetings recently. I don't know if they're still under employment from Pilgrim or if they've gone off and done other things (*A. Bicking, personal communication, 2017*).

It's going to be difficult to find [people who are for the pipeline] to be completely honest and one of the reasons is, my guess is that this project, unless something strange happens on the federal level to make it happen… we're probably not going to see it move forward. The company has not submitted it's scoping document to the state and investors have been pulling out of the project… So reading the writing on the wall it doesn't look like it's going to move forward at this point but I think a lot of that is also because of the advocacy. That they make it challenging for you to find someone who can tell you a supportive position (*A. Bicking, personal communication, 2017*).

There's always a contrarian in the crowd that wants to stand up and rightly say, you don't like trains, you don't like barges, you don't like pipelines, how are we going to get the oil? And then I usually respond to that by talking about all the things that New York State, all the policies that New York State is taking to promote electric vehicles, reduce oil demand by getting people to switch their heating from oil to more efficient sources. Primarily you should just look at the number of communities that have passed resolutions

> in opposition to the project, which is over 30 in New York from a diverse number of towns with diverse political leanings to kind of see how broad the opposition is. You can also look to the statements of the company Global in Albany and Buckeye that have commented on Pilgrim saying they are in universal opposition to that project and they've even disavowed it (*J. Cherson, personal communication, 2017*).

Additionally, although we found no other supporters of the proposed pipeline, some communities have yet taken a stance on the pipeline. According to Jim Quigley this is because of lack of community involvement or interest:

> The reason the town was not in the forefront of taking a position on [the Pilgrim Pipeline] is because no one came to the town board that lives in the town and said anything. And it's exactly the same thing that happened in the Niagara situation; the entire opposition was based on people from outside the community (*J. Quigley, personal communication, 2017*).

4.10 GIS Data

Adirondack Park

The classification of Adirondack State Park shows private land, state land, and water systems. Although the Canadian-Pacific rail line runs along the outside edge of Adirondack State Park, it runs closely to private land that is classified as resource management or rural use. Figure 6 shows the classification of Adirondack State Park with New York counties, highlighting the expansiveness of the park.

Critical Lands

The proposed Pilgrim Pipeline and the existing rail lines cross critical habitats in New York State. Figure 8 shows that the proposed route of the Pilgrim Pipeline will cross some historical sites, as well as some first plan zones.

Critical Water

Figure 9 shows that all of the existing rail lines lie on many different water sources throughout both New York and New Jersey, such as aquifers, wetlands, watersheds, linear hydrography, and rivers. Although it is not on the map, the proposed route for the Pilgrim Pipeline also crosses many of the water sources that the rail lines cross.

Income Levels

Figure 10 highlights the differences in the monthly income levels of the counties along the proposed route of the Pilgrim Pipeline. The red coloration shows the lowest income levels, while the dark blue shows the highest income levels. As you move away from Albany, the income levels begin to drop. Figure 11 also shows the income levels, but shows them along the existing rail lines in New York. The red still shows the lowest levels of income and the dark blue shows the highest incomes. The income levels of the counties along the Canadian-Pacific rail line are lower than much of the other counties along the two other rail lines. Figure 12 shows the income levels in New Jersey along the existing rail line and the proposed route for the Pilgrim Pipeline. The income seems to be more varied along the proposed route for the Pilgrim Pipeline compared to the levels of along the rail line.

School in New Jersey and New York

Figure 13 shows the schools in both New York and New Jersey. The schools in New York State are more spread out compared to the schools in New Jersey or New York City. Along the Chessie and Seaboard line in New York, there are a couple of clusters of schools, as well as a large cluster of schools along the rail line in New York City and the proposed route of the Pilgrim Pipeline.

Projected Train Traffic Per Month

Figure 14 shows the projected total number of trains per month that would be required in 2018 if the Pilgrim Pipeline was to be constructed. The total number of trains that would move along the Chessie and Seaboard rail line is 98 trains, while the total number along the Canadian-Pacific rail line would be 24 per month. The total of trains per month that the pipeline would equal is 70.

Figure 6: *Adirondack Park Classification with Counties*

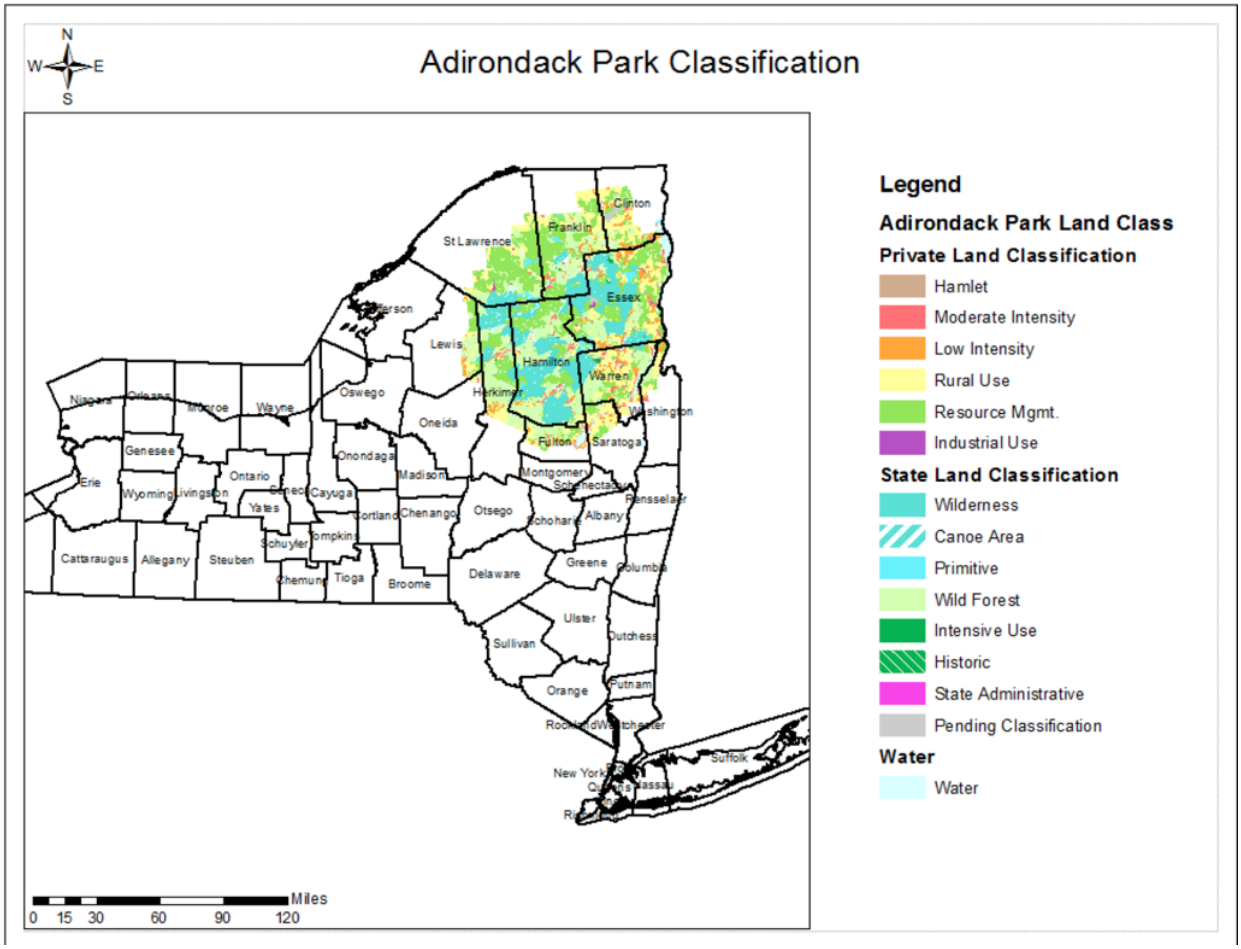


Figure 7: *Adirondack State Park Classification with Canadian-Pacific Rail Line and Counties*

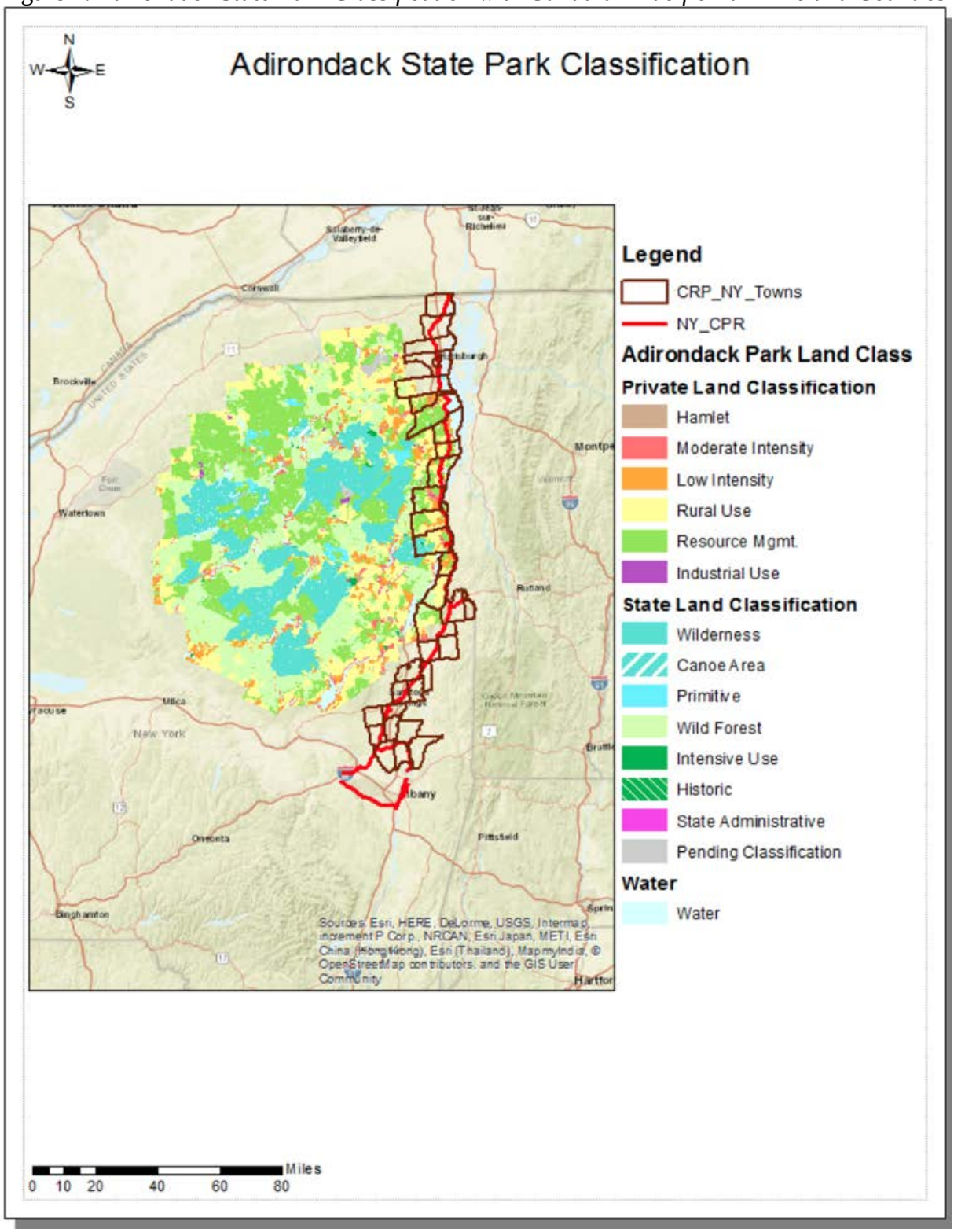


Figure 8: *Critical Lands in New York*

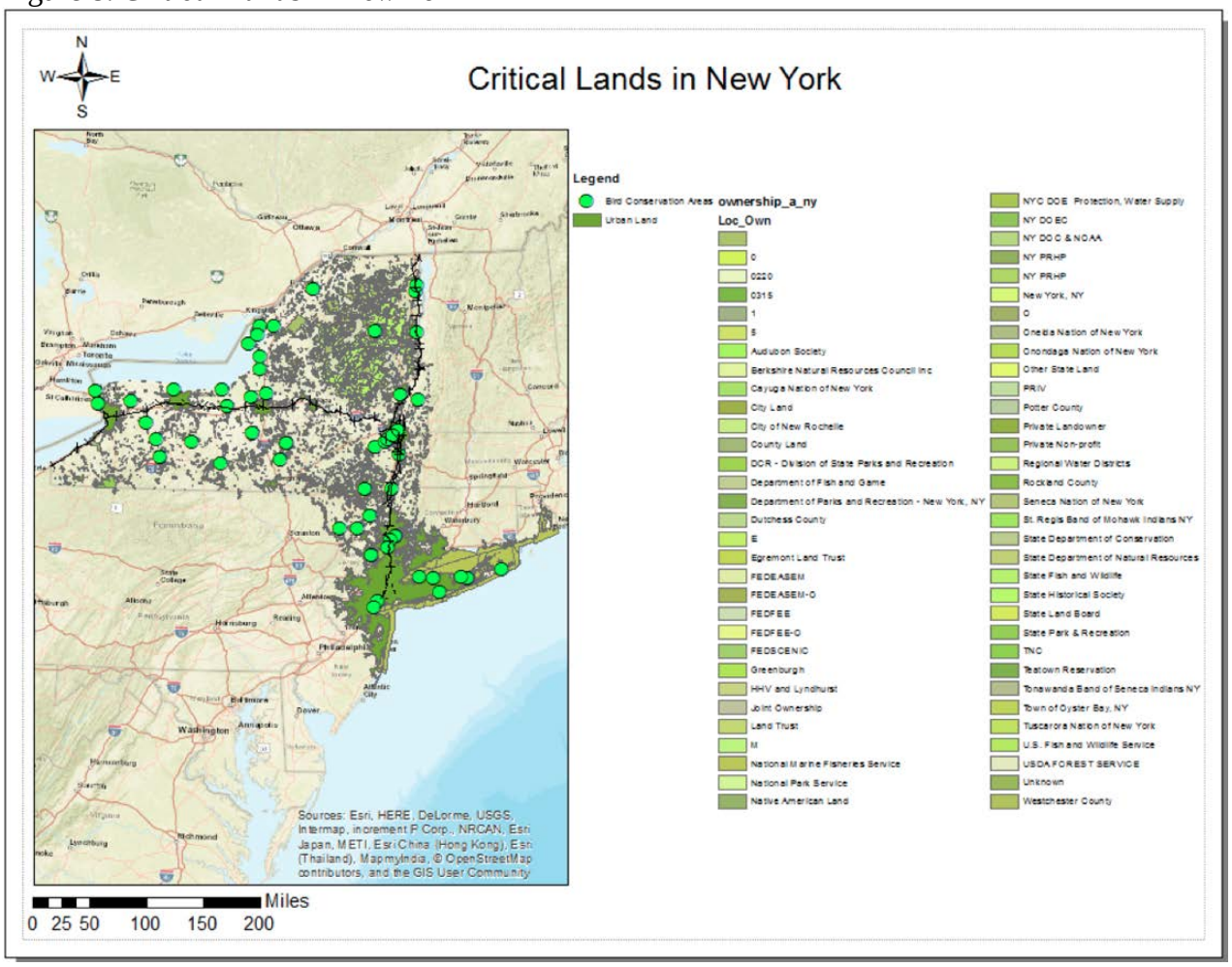


Figure 9: *Critical Water in New York and New Jersey*

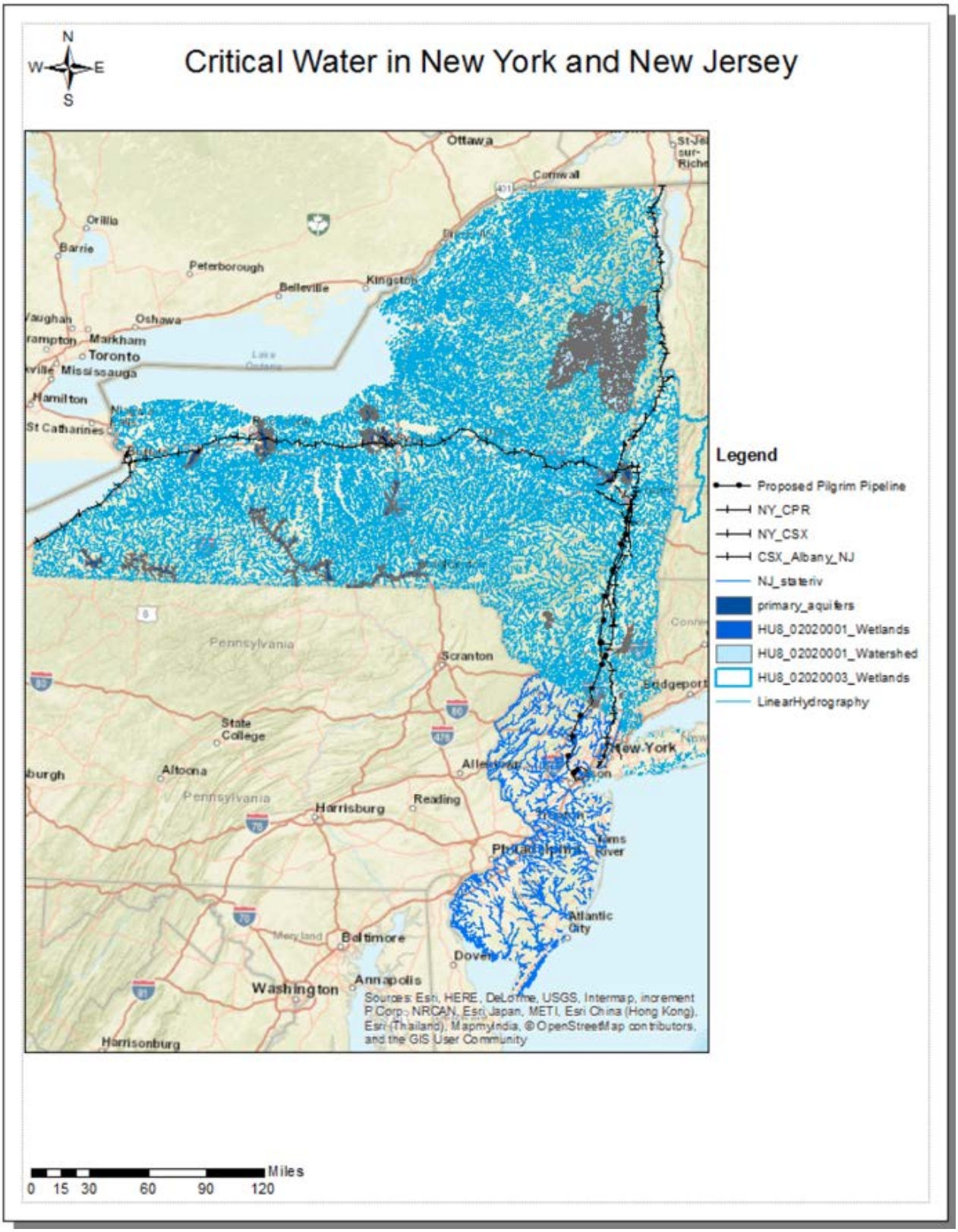


Figure 10: *Monthly Income Levels Along the Proposed Pilgrim Pipeline in New York*

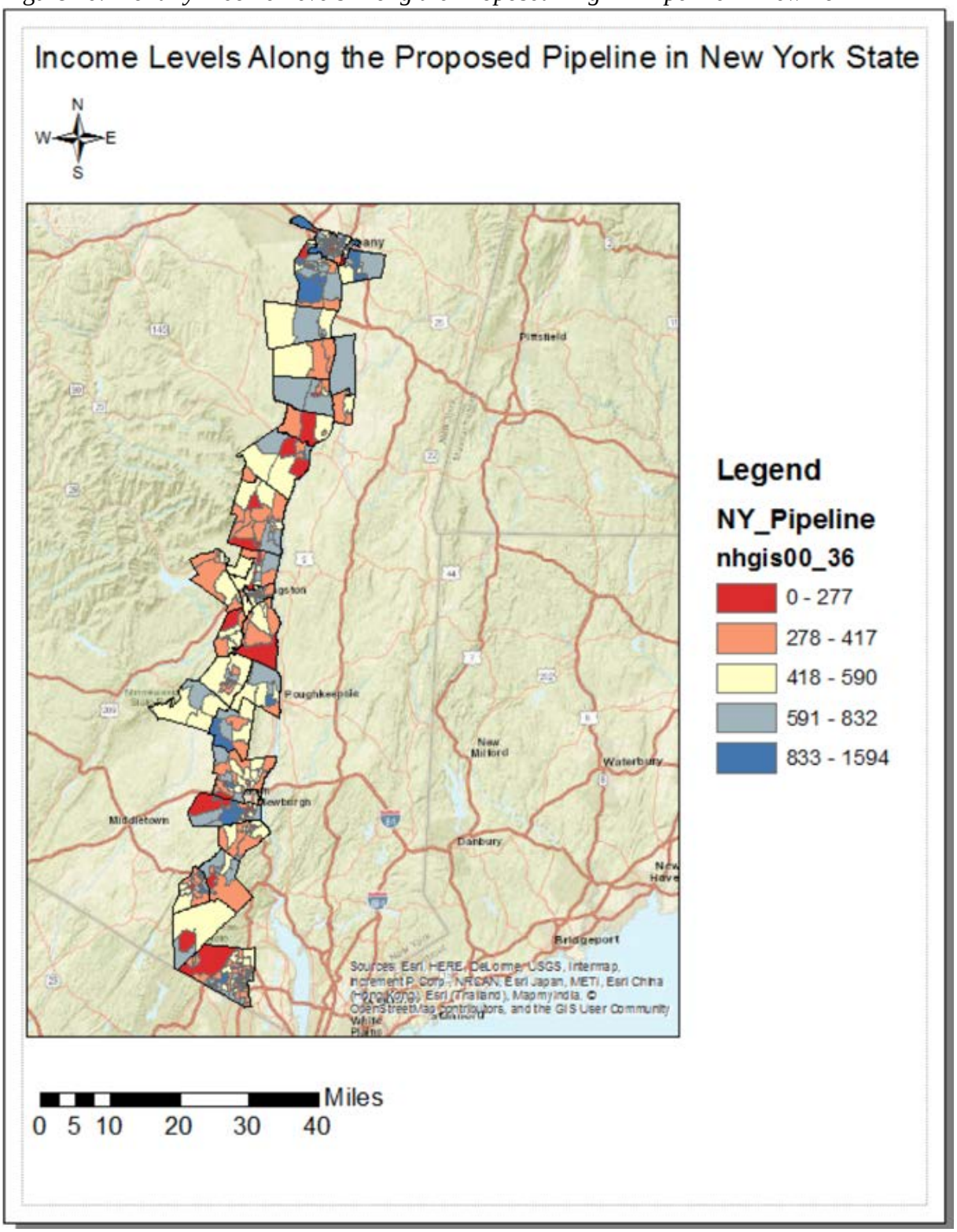


Figure 11: *Monthly Income Levels Along the Rail Lines in New York*

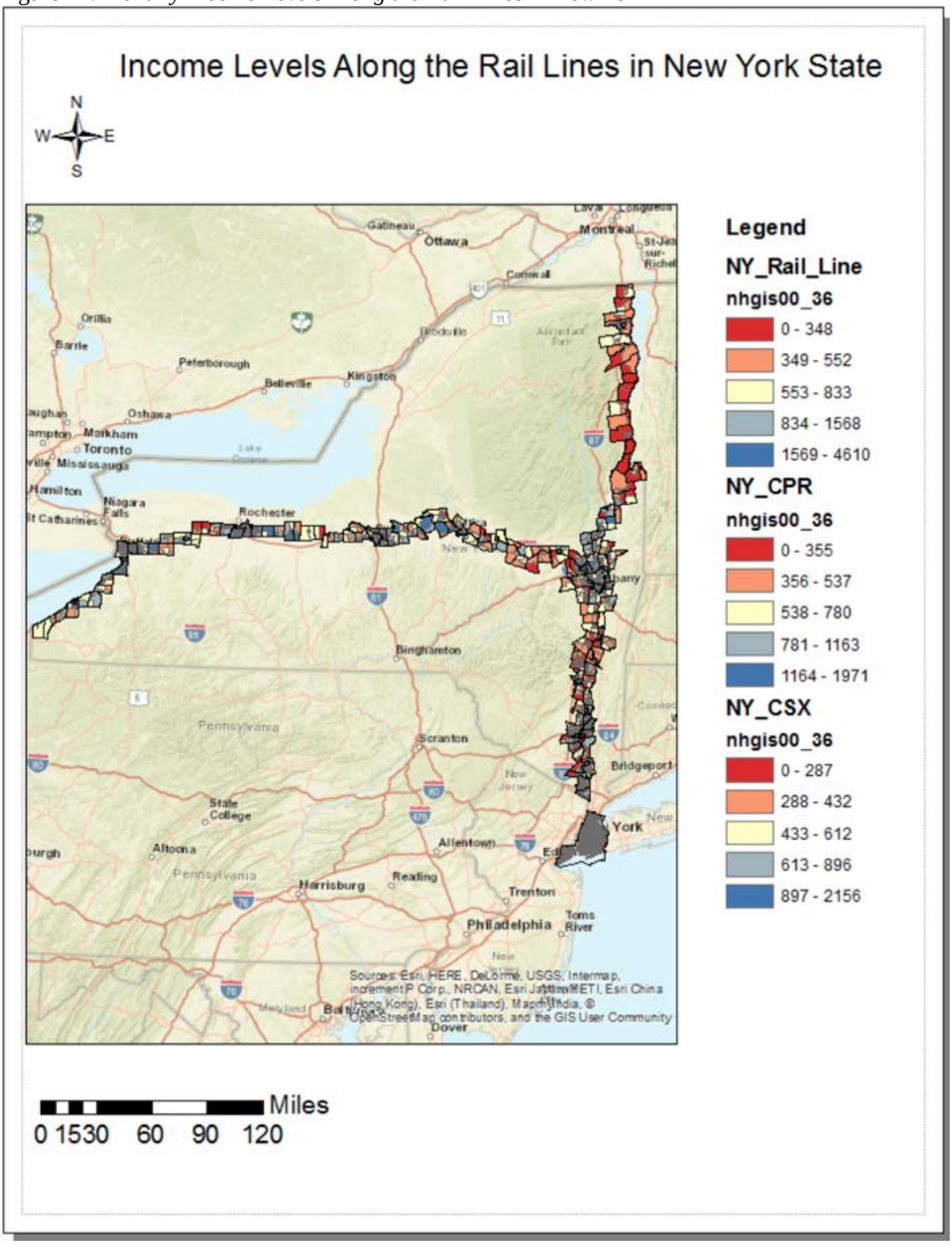


Figure 12: *Monthly Income Levels Along the Rail Line and proposed Pilgrim Pipeline in New Jersey*

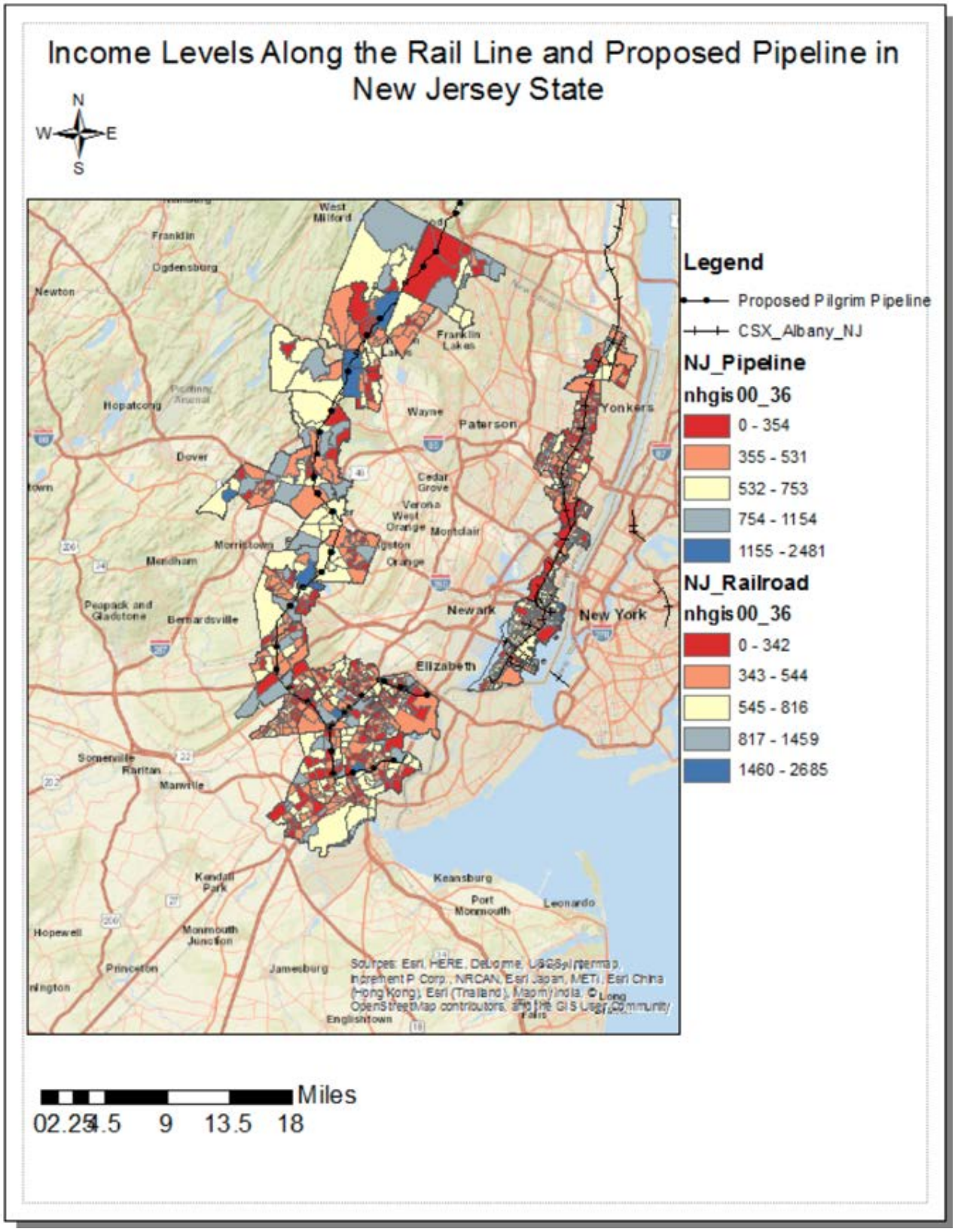


Figure 13: *Schools In New York and New Jersey Along the Proposed Pilgrim Pipeline*

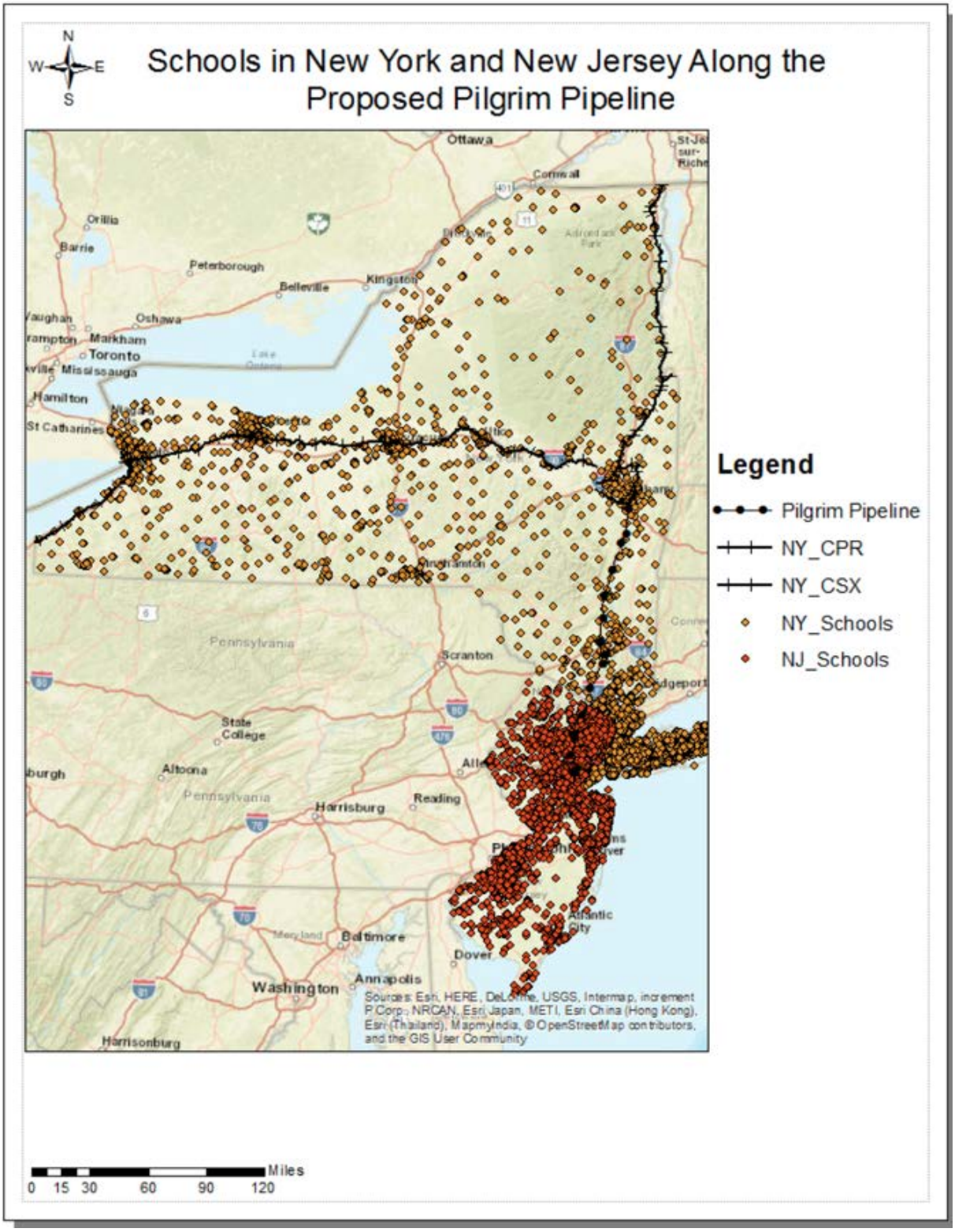
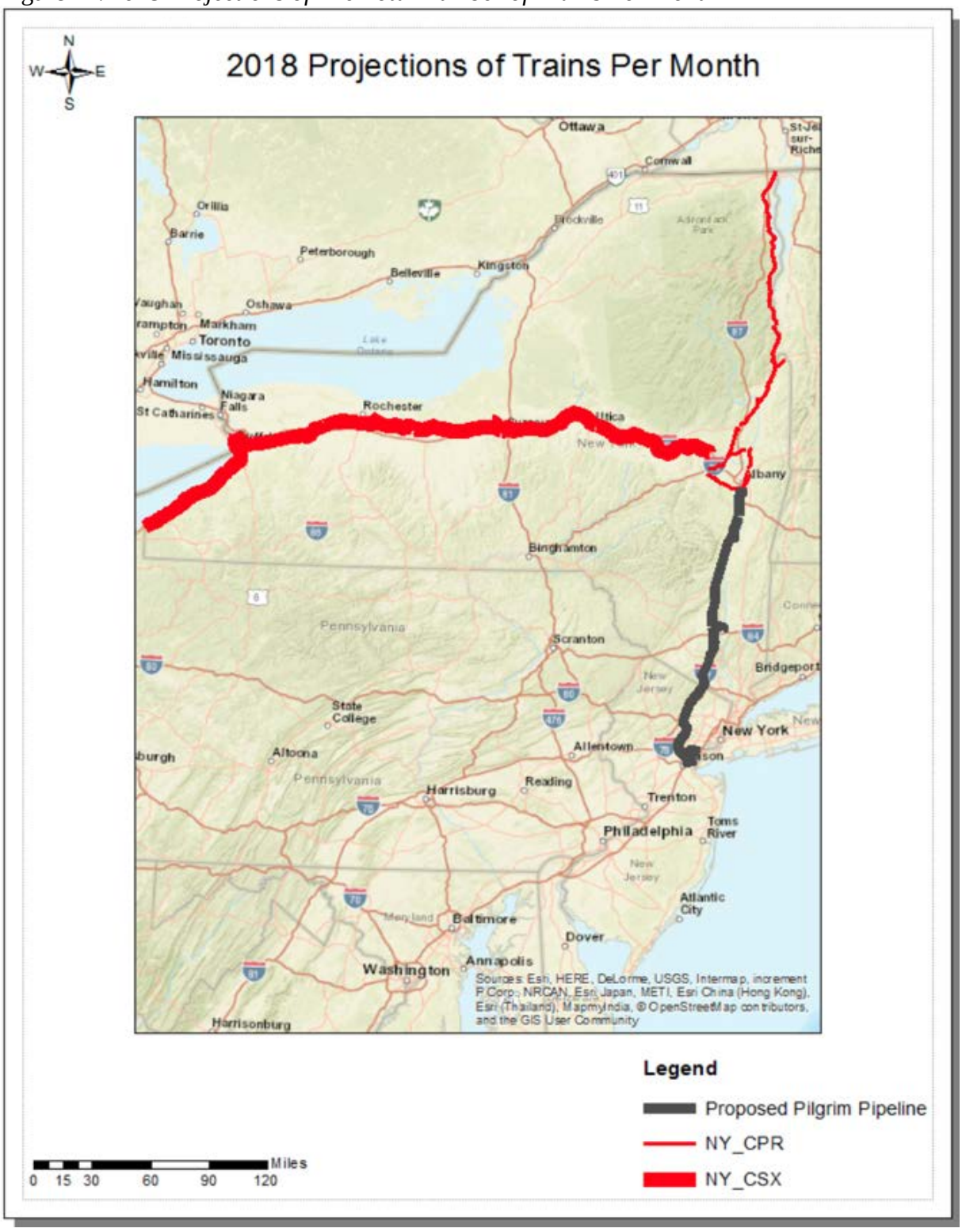


Figure 14: *2018 Projections of The Total Number of Trains Per Month*



5.0 Discussion

Over the course of this eight-month study, we contacted over 50 individuals and organizations for interviews regarding the Pilgrim Pipeline, which typically required multiple calls and emails. We were rejected primarily by legal firms and elected officials, namely Governor Cuomo, and redirected to Freedom of Information Laws (FOIL) requests by the NYSDOT and the New York State Thruway Authority, which then rejected us. After extensive communication with the offices of Congressman Tonko and Congressman Faso, both rejected our request for an interview, however Tonko hosted a public question and answer period at Skidmore College and we were able to ask him briefly about his stance on the pipeline. Overall, only one grassroots organizer rejected us on the basis of lack of time, and this is reflected in the high volume of NGO members and influential community member respondents. In total the 14 semi structured interviews that we conducted amounted to over 100 pages of transcriptions regarding respondents' perceptions of the Pilgrim Pipeline.

5.1 Activism

Generally grassroots groups, such as non-profits organizations, and interest groups, such as elected officials, are unable to cohesively work together to solve a problem (Scarce, 2017). However, in regards to the Pilgrim Pipeline, all groups were able to work together and educate the public. When speaking to stakeholders, we found that many of them had heard about the pipeline from Jen Metzger after she organized a meeting in New Paltz. Bill Boehmke and Sustainable Saratoga became involved after talking to Dr. Stephen Shafer, and Jim Quigley was contacted by his constituents when Pilgrim began performing right away surveys near their homes and businesses. Because there was a wide variety of ways for individuals and influential community members to become involved and prioritize this issue, it helped the activists begin

the fight against Pilgrim. Additionally, all of our respondents had heard of the Pipeline about two years prior to our interviews with them. Their early involvement made it easier for steps to be taken to engage communities surrounding the proposed pipeline before Pilgrim submitted any permits, greatly slowing the progress of the pipeline. Pilgrim has also inspired many citizens to become involved with an issue they normally would not have. All of these factors have made the activism against the Pilgrim Pipeline a model for other communities to follow on how activism can be successful.

5.2 Environmental Impacts of Pipelines and Associated Increase in Oil Trains

There are a number of environmental impacts of the pipeline and the associated increase in oil trains, and the concern of water quality often linked in with environmental concerns. Respondents were worried not only about potential for spills, but also about degradation as a result of pipeline construction. Some respondents also connected environmental degradation to reliance on oil in that the burning of fossil fuels emits greenhouse gases, which are known to have adverse effects on air and water quality and contribute to global climate change.

From Andy Bicking's perspective, the Hudson River is the most important environmental concern. Jeremy Cherson had a very similar perspective, noting the importance of the major tributaries to the Hudson and the 300 wetlands listed along the Pipeline route by the DEC, all of which would face severe and lasting impacts in the event of a spill. Other respondents, like Mary Ellen Ryall, looked at water as a sacred, finite resource that must be protected for future generations because it is necessary for all life. Jen Metzger took a similar stance, speaking about the reliance of many small towns on well water, which is extremely susceptible to contamination by polluted surface and groundwater. Metzger went as far as to say that it is only a matter of time

before a pipeline leaks, and the quality of water for people living near the pipeline is therefore very much at stake.

Paul Nathanson, representative for Pilgrim Pipeline Holdings, said multiple times that pipeline would be the best way to transport fossil fuels in terms of emissions, efficiency and "environmental friendliness". He also spoke about the intensity of the environmental review policies in New York and New Jersey, noting, "it's a very extensive process, as it should be" (*P. Nathanson, personal communication, 2017).* Overall, we found that all of our respondents, Paul Nathanson included, worried about the potential for water pollution as the most important aspect of environmental degradation caused by the Pilgrim Pipeline, however while Nathanson said that the Pipeline would reduce environmental impacts, our 13 other respondents felt that the Pipeline threatened their immediate environment and that of the greater Hudson Valley region.

5.3 Need for Renewable Energy

The State of New York has an energy plan of cutting fossil fuel emissions by 40 percent and sourcing energy from 50 percent renewable technologies. Congressman Paul Tonko does not want the state to only rely on pipelines as a way to receive energy. He believes that if better battery technology were to be produced, the state would be able to transition over to a greener energy supply. Therefore, we need to be finding a balance between short term and long term goals and commitments. Paul Nathanson also understood that there is a need to balance the types of infrastructures that we rely on for energy. Because Pilgrim Pipeline Holdings, LLC. believes that pipelines are the safest mode of transporting oil, Nathanson feels that pipelines are needed because of our continued dependence on fossil fuels. Assemblyman Kevin Cahill has invested personal interests in renewable energy and took initiative to solarize New York and improve net metering so that individuals could supply their own energy conservation. Sue Rosenberg

mentioned how investing in a pipeline will remove New York from their energy goal and push the dependence of the state even further onto oil.

5.4 Need for Education on Fossil Fuel Infrastructure

Instead of implementing a new pipeline, New York should focus on fixing current fossil fuel infrastructure. In the beginning, there were many supporters of the pipeline, but once they were educated about fossil fuel infrastructure, many people switched to be in opposition. Mary Ellen Ryall believes that our country hasn't focused on environmental education and that education is paramount at all levels. Rebecca Martin believes it is important for counties to support the educational opportunity that was created through the Pilgrim Pipeline. There were some communities that did not pass resolutions in opposition to the proposal. Andy Bicking believed these communities did not take a stance because they either supported the project, didn't understand it, or were not paying attention. Therefore, it was important for the non-profit organizations to get involved in educating communities on the potential impacts of the pipeline. Paul Nathenson understood that there is a need for development of renewable energy infrastructure, but notes that our dependence on fossil fuels is not slowing down. He says we are still going to need to transport fossil fuels and should do so with the safest type of technology, which he believes is pipelines.

5.5 Activism and Whiplash Effect in Response to the Dakota Access Pipeline (DAPL) and the Keystone XL Pipeline

Media attention around the DAPL and and the Keystone XL Pipeline have caused the general public to increase their awareness of the issues surrounding crude oil pipelines, as well as pipelines in general. Therefore, it has created a notion that all activists against pipelines are involved in the same fight against oil companies whose efforts would have little benefit to the communities impacted the most. Andy Bicking believes that the efforts being made against

pipelines like DAPL are educational and necessary for other anti-pipeline activists to understand. Jen Metzger thinks that because the fights are interconnected, everyone needs to be in support of the efforts made by people around the country and use our resources to work together against these projects. Sue Rosenberg believes that not only are the other pipeline fights the same as Pilgrim but also as any communities exploited by corporations resulting in negative environmental or health effects for the communities. And this widespread belief of a united front within the activism against the Pilgrim Pipeline has been one reason why this activism has been so successful and a wide variety of stakeholders have combined their efforts in solidarity against the pipeline.

5.6 Human Health, Public Safety, and Environmental Justice Concerns

Unfortunately, marginalized communities often have higher risks associated with environmental hazards. Bill Boehmke discussed a derailment in Oregon, where a train had derailed even though it had slowed down when it reached the town. Unfortunately, the foam equipment used to douse the fire was useless because of the heat coming off of the flames. The additional weight from the cars had caused the train to derail. Bill suggested that the trains need to be shorter if they are going to be so heavy. Chris Mathiesen discussed the number of oil tankers moving through this area and that if Pilgrim Pipeline were to be passed, it would not help to reduce the number of oil tankers.

Figure 9 shows the monthly income levels of communities along the Pilgrim Pipeline in New York State. There are many red, orange, and yellow areas that show extremely low income levels, no higher than $590 a month. If you wanted to look at that map in terms of yearly income levels, the highest income on the map would be $19,000 a year. According to Jen Metzger, there is a lack of inspection of pipelines because of the small number of inspectors within the federal

government. Therefore it is hard to know exactly when a problem arises, which can cause safety hazards. The South End of Albany already faces higher risks from trains carry crude. Jeremy Cherson talked about how the proposal of the pipeline would increase the threats to the South End. Mary Ellen Ryall and Jen Metzger also discussed this fear of polluting an area that is home to low-income communities.

5.7 Negative Economic Impacts

The Pilgrim Pipeline would have little benefit to New York State. Andy Bicking discussed the topic of jobs. Although the pipeline would bring in construction jobs, he believes that the short-term benefits do not balance with the long-term benefits. The public has an interest in maintaining a healthy environment that can support the economy and tourism. The pipeline would not support the goals of the public. According to Mary Ellen Ryall, Saratoga Springs is all about health, horses, and the environment. The construction of the pipeline would increase the number of oil trains moving through New York and would have little benefit to the Saratoga Springs community. The oil needed to fill the pipeline would just be passing through the Hudson Valley, which means it would have little economic benefit to those communities. Pilgrim Pipeline Holdings, LLC. stated that the pipeline would bring in 50 permanent jobs, but never mentioned if the jobs would be strictly for citizens of New York State. Sue Rosenberg talked about the power of big corporations, as they are able to risk the environment and communities without having to harm themselves. Jen Metzger discussed the impacts the pipeline could have on the agricultural and tourism sectors of New York State. On the other hand, Jim Quigley discussed how large amounts of activism can create an environment where no one wants to do business. If companies do not want to work with communities, then there won't be any jobs within those communities.

5.8 Support for the Pilgrim Pipeline

We were unable to find respondents that expressed support for the Pilgrim Pipeline, other than Paul Nathanson from Pilgrim Pipeline Holdings, LLC. No respondent was able to identify supporters, but suggested reaching out to municipalities that had not taken a stance or submitted a resolution of opposition. Andy Bicking discussed the lobbying firm that Pilgrim Pipeline had hired to attend public community meetings, but that recently, the individuals from the firm had not been seen at meetings. He also noted that as far as he has seen, Pilgrim Pipeline Holdings, LLC. is the strongest supporter of the pipeline proposal and that advocacy has made it difficult to find people who are supportive. Jim Quigley mentioned that the Town of Ulster did not take a position on the Pilgrim Pipeline issue because no community member stepped forward requesting any action to be taken. He noted that like the issue regarding the bottled water company, it was people from outside the community that forced the company away. According to Jeremy Cherson, Global in Albany and Buckeye have commented stating that they oppose the pipeline and have even disavowed it. Because of many of these reasons, it was difficult to find supporters of the pipeline proposal. Activism has spread throughout the state and allowed citizens to make educated decisions regarding the proposal.

5.9 Geographical Information Systems

Adirondack Park

The Adirondack Park, which is located in the northern portion of New York, is classified by private land, public land, and water. Generally, the middle areas of the park are classified under public land, such as wilderness, canoe areas, and primitive. The Canadian-Pacific rail line runs mostly along rural use and resource management land, but it also runs along the water, which could pose as an issue if there were to be a derailment. When observing the classification

of the park, most of the wilderness lands is centered in the middle of the park, with much of the private land on the outside ring of the park boundary. So far, there is one canoe area and a sprinkling of primitive lands throughout the park. The rail line poses a serious threat to the water system that is along the eastern edge of Adirondack Park. Figure 6 and 7 both show the classification of Adirondack Park, but figure 2 shows where the rail line falls within the boundary of the park.

Critical Lands

Within New York, the rail system crosses some urban lands, which means that there is a significant chance that a derailment could harm a large amount of people. Near the bottom of New York, the proposed route for the pipeline and the rail line both pass through a state park that is classified for recreation, as seen in figure 8. The rail line passes through a few bird conservation areas, but the proposed route for the Pilgrim Pipeline does not pass through any. However, it would end close to a couple of bird conservation areas, which could be an issue if there were to be a leak in the pipeline.

Critical Water

All of the rail lines and the proposed Pilgrim Pipeline all pass through much of the linear hydrography throughout New York and New Jersey, which means that there are many possibilities for oil to be leaked into the water system. The rail lines also are along much of the area hydrography, which means many of the lakes and ponds throughout New York could easily be contaminated. The Chessie and Seaboard rail line passes through five different primary aquifers, which could pose a threat to human life if the sources are used from drinking water. Although the Canadian-Pacific rail line does not pass through one of the main wetlands or watersheds, it is very close to it, which means that it has the potential to still contaminate the

water. However, the Canadian-Pacific rail line is directly located on another wetland, as shown in figure 9.

Income Level

As you approach Albany, there is a variety of incomes, but the surrounding outskirts of the city seems to have higher incomes. As you move down the route of the pipeline, the levels of income seem to stand around the middle and low ranges, as seen in figure 10. Figure 11 shows highlights that the Canadian-Pacific rail line seems to hold the lowest of the income levels. But, along the Chessie and Seaboard rail line, the income levels seem to be more varied. Other than the route of the Canadian-Pacific rail line, there does not seem to be a correlation between income level and the routes of the rail lines and proposed pipeline, except in New Jersey. Both the rail line and the proposed Pilgrim Pipeline have a greater amount of dark or light red colors, which means that there are lower income levels in New Jersey, as seen in figure 12. It can be assumed that if there were to be a derailment along the rail lines or the pipeline within an area of lower, there would not be as much of a push for a cleanup proposal. However, if the derailment were to happen in an area with a higher average income, there is a greater possibility that the media would cover the contamination and that there would be a faster cleanup process.

Schools in New Jersey and New York

Although New York has is an overall larger state than New Jersey, there still seems to be some areas of clustering along the rail lines in New York. Figure 13 shows the four main clusters that are along the Chessie and Seaboard, which means that there are a large number of schools that could be harmed from a possible derailment or explosion. Both the rail line and the proposed Pilgrim Pipeline are surrounded by schools in both New Jersey and New York, which means that there is an extremely high risk of contamination or harm for the schools.

Projected Train Traffic Per Month

Figure 14 shows the projected total number of trains per month moving along the two rail lines if the Pilgrim Pipeline were to be constructed. The total number of trains that would move along the Chessie and Seaboard rail line is 98 trains, while the total number along the Canadian-Pacific rail line would be around 24 trains per month. The Pilgrim Pipeline would be equal to 70 trains per month, since the total amount of oil that the pipeline can move is 200,000 barrels per day. There would need to be an increased amount in trains moving throughout New York, which means there will be a greater chance of derailment or explosion.

6.0 Recommendations

Fixing Existing Fossil Fuel Infrastructure

The Pilgrim Pipeline would be a forty-year commitment to fossil fuels and would have little economic benefit to New York State, and because the Pilgrim Pipeline would only be moving through the state of New York and not supply the state with energy, we recommend that New York State rejects the proposal. Many of our respondents discussed focusing on investing in current infrastructure, instead of building more. Even though the Pilgrim Pipeline is not a federally funded pipeline project, we agree and believe that New York State should invest in fixing the current infrastructure, such as trains. Although the DOT-111 train cars are required to be phased out by 2023 and replaced by double-shell train cars, more money needs to be invested into this project because the new trains are expensive. The fracking liquids have an easy time deteriorating the already thin single shell DOT-111 cars. The trains are required to slow down when approaching towns and cities, but that does not fully eliminate the derailments. In order to safely transporting hazardous and flammable material, the train cars need to be replaced and rebuilt. One big issue the state needs to focus on is how to dispose of the current train cars.

Currently, the trains are being stored along rail lines until they can be cleaned and repurposed. Because oil prices have plummeted and a large number of train cars have been taken out of service, many companies are not pressured to replace the train cars. We also believe that New York State needs to invest in a greater number of inspectors. Having a total of 8 inspectors for over 70,000 private train bridges does not allow for proper inspection.

Investing in Renewable Energy

Although it is not feasible for New York State to move to a renewable energy economy immediately, while investing in our current fossil fuel infrastructure, New York State should continue to try and reach the 2030 renewable energy goals. Investing in a pipeline estimated to have a 40 year lifespan would maintain New York State's reliance on fossil fuels. Because the trains have all but stopped moving through New York at this time, that means that the construction of this pipeline would dramatically increase the crude oil moving through New York State and at this point would not be necessary. As Councilwoman Jennifer Metzger stated, the renewable energy sector is a labor-intensive field, providing long-term employment, while fossil fuel infrastructure provides very few long-term jobs and mostly short-term construction jobs. Therefore, we believe investing in renewable energy would stimulate the New York State economy and alleviate concerns of citizens like Ulster Town Supervisor Jim Quigley, who thinks environmentalists are driving away business investment in New York State.

7.0 Conclusion

Through our research we gained a better understanding of the current transportation methods for crude oil through New York State: trains, barges, and pipelines. Our semi-structured interviews reveal how influential community members facing this issue perceive the risk of this proposal. We learned that almost everyone along the pipeline route oppose the pipeline and that

the cohesive efforts of nonprofits, citizens, and elected officials have successfully slowed the progress of the pipeline. Because of the strong opposition that citizens of New York have toward the Pilgrim Pipeline, and the little benefit it would provide to the state, New York State should aim to repair its existing fossil fuel infrastructure and devote resources to providing more renewable energy rather than investing in a 40-year pipeline, which would transition away from the NYS Energy Plan for 2030 and maintain New York State's reliance on fossil fuels for decades.

Our research exemplifies the contention of fossil fuel infrastructure currently affecting citizens across the United States. The Pilgrim Pipeline proposal comes at time when pipeline companies are recognizing the inevitable decline of fossil fuel in exchange for increasingly economically viable renewable energy sources. For this reason, the nation is currently fielding multiple pipeline proposals. With a government denying global climate change and favoring domestic fossil fuel resource extraction, some of these pipelines may be permitted. However, the resounding opposition to the Pilgrim Pipeline that we have found in New York state is also mirrored in New Jersey, and reflects the nationwide opposition to DAPL and the Keystone XL pipelines. Our findings are congruent with nationwide demand at local and state levels to transition from fossil fuels toward safer and more environmentally sustainable sources of energy. While this climate may not be seen in the current Presidential administration or congress, the dedication of civilians, NGOs, and members of local governments to reject fossil fuels demonstrates the transient nature of these industries going into the future.

Our research serves as a case study that demonstrates the perceived risk of the construction of oil pipelines and the power that statewide advocacy can have when applied to environmental causes. Because pipelines pass through many counties and towns, every citizen

should be able to have their voice heard. This study also highlights the importance of educating citizens on projects proposed and happening in their communities, allowing them to make educated decisions on issues that would directly affect them. Our findings can assist other activist movements in their work against risks associated with the environment, human health and safety, and negative economic impacts that are caused by large corporations exploiting communities for their resources. By showing that activism can be successful, our research provides a framework for activists to educate and empower communities to effectively voice their concerns regarding relevant issues to their local, state and federal governments.

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9.0 Appendix 1: Interview Questions

What we want to know either through preliminary research or interview:

- Is the Pilgrim Pipeline an issue within the agenda? Could you explain your stance on the pipeline?
- What type of influence do you have over the potential pipeline? Would you like to have more or less influence if possible? In what way?
- How do you think it will affect your constituents? Do you think that they perceive the same or similar potential effects for themselves and their communities?
- How do you think this proposal addresses public safety, economy, low-income communities?
- Do you perceive potential for environmental impact and hazards associated with the proposed construction and usage of this pipeline?
- (If applicable) What do you think about the increase in trains carrying crude oil to meet this pipeline?

- Explain the extent of feedback from your constituents about the pipeline, either positive or negative?
- How do you feel regarding your position on the pipeline following the election results?
- Is there anything that we've overlooked, or that you would like to share with us beyond the conversation we've just had?