

*Priorities in Climate Change Adaptation:  
An Analysis of Four Tribal and Non-Tribal Plans*

A thesis submitted by

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## Abstract

As we move into a future with a transforming climate, governments may have differing ideas of what they want to preserve beyond today. Climate adaptation plans offer an opportunity to learn how various governments understand climate risks and adaptation strategies. Due to their statuses as sovereign nations, federally recognized American Indian Tribes may have different priorities for climate change adaptation compared to other governments in the United States. To explore differences between Tribal and non-Tribal climate adaptation planning, I analyzed comparable adaptation plans from two Tribal nations and two non-Tribal municipalities in the northeastern United States. My analysis surfaced the types of systems, resources, and vulnerabilities prioritized by each plan and revealed two main approaches to adaptation planning: relational and technocratic approaches. Additionally, I found that the two Tribal climate adaptation plans had three continuous themes embedded in their texts: ecological adaptation, sovereignty, and cultural continuity.

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## Chapter 1: Introduction

### 1.1 Introduction

As we move into a future with a transforming climate, governments may have differing ideas of what they want to preserve beyond today. Climate adaptation plans (CAPs) offer an opportunity to learn how various governments understand their climate change risks and the strategies they are developing to address such risks. Federally recognized American Indian Tribes are sovereign nations, regarded as domestic dependent nations (*Johnson v. McIntosh*, 21 U.S. 543 (1823); *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831); *Worcester v. Georgia*, 31 U.S. 515 (1832)), that deal with the settler-colonial United States on a government-to-government basis (Krakoff, 2007). The historic and ongoing colonization of traditional Tribal territories has led to complex Tribal regulatory and land planning authority (Ford & Giles, 2015; Wood, 1994). Furthermore, literature on climate change highlights both the risks Indigenous peoples, including American Indian Tribes, face with the changing climate (Galloway McLean et al., 2009; Jantarasami et al., 2018; Krakoff, 2007) and their adaptive capacities (Daigle et al., 2019; Hosen et al., 2020; Norton-Smith et al., 2016; Turner & Spalding, 2013).

These qualities make Tribes distinctive from other governments in the United States (i.e. states, cities, towns) that are planning for climate change and may indicate different priorities for adaptation. While there has been research analyzing Tribal climate adaptation plans (Warner, 2015), there is limited scholarship comparing the distinctions between Tribal climate adaptation plans and those of comparable non-Tribal governments. Such a comparison is informative for planners and policy makers; they can learn how different governments approach climate change adaptation, diversifying the ways that adaptation may be understood. To explore the comparison

between Tribal and non-Tribal climate adaptation planning in this thesis, I examine the ways that four climate change adaptation plans approach their adaptation planning to answer the following research questions:

1. What are Tribal nation priorities and how are they communicated through their climate adaptation plans?
2. How are Tribal climate adaptation plans distinct from non-Tribal climate adaptation plans?

I selected comparable climate adaptation plans from two Tribal nations and two non-Tribal municipalities in the northeastern United States: The Shinnecock Nation, The Saint Regis Mohawk Tribe, the City of Albany, and the boroughs of Brooklyn-Queens. To inform my analysis of the four plans, I conducted a review of scholarship at the intersection of Tribal land planning and climate change adaptation, and I researched background information on climate adaptation plans and the two Tribes. From this foundational information, I conducted a content analysis using the key terms “system,” “resource,” and “vulnerable,” which are topics highlighted in the literature and covered across the plans. Through my analysis of the language used by the documents, I pulled out insights regarding the types of systems, resources, and vulnerabilities prioritized by each plan.

The results of my content analysis revealed two main approaches to climate adaptation planning: relational and technocratic approaches. The Akwesasne plan takes a primarily relational approach to adaptation planning, while the Brooklyn-Queens plan is largely technocratic in its approach. The Albany and Shinnecock plans, however, do not fall simply within one approach or the other. The Shinnecock plan shows that Tribal adaptation plans do not automatically fit into a relational approach, which counters what is implied by the literature on the topic. Similarly, the

Albany plan does not inherently fall within a technocratic approach simply because it is a non-Tribal plan; rather, the two plans blend the approaches. This also indicates that the two approaches may be used in combination to varying extents and are not inherently opposed. Additionally, I found that the two Tribal climate adaptation plans had three continuous themes embedded in their texts: ecological adaptation, sovereignty, and cultural continuity. These themes may expand the ways that planners understand adaptation strategies and inform policy makers working to support Tribal climate adaptation.

## 1.2 Thesis Outline

In Chapter 2, I describe limitations to my thesis, research methods, and how I selected the climate adaptation plans. Chapter 3 consists of my literature review, in which I describe scholarship on the impacts of climate change on Tribal nations, Tribal sovereignty and self-determination, Tribal traditional knowledge, Tribal land and reservation planning, and Tribal climate adaptation planning. In Chapter 4, I describe the backgrounds of the Tribal nations, including their geographies and histories, inter-governmental relationships, current impacts of climate change, projected impacts of climate change, and how the Tribes are addressing climate change impacts. I also provide background information on climate adaptation plans in this chapter. I outline the results of my content analysis, both manifest and latent analyses, in Chapter 5. I discuss my findings from the content analysis in Chapter 6. These findings pertain to the different ways the plans approached adaptation, and the notable themes I gathered from the Tribal CAPs through the content analysis. Chapter 7 concludes my research with a summary and recommendations for policy makers and planners.

## Chapter 2: Methodology

### 2.1. Introduction

For my research methods, I first completed a literature review to focus my reading of the CAPs within scholarship on climate change, American Indian land use, and adaptation planning (described in Section 2.4). Then, I compiled background information, including institutional and legal relationships, how climate change is currently impacting the Tribes, and how climate change is projected to continue impacting the Tribes. Lastly, I analyzed all four adaptation plans using content analysis methods (described in Section 2.5). The content analysis quantified the key terms as they appeared in the plans and the various ways that the plans use the terms, as well as how each CAP is distinct in its use of the key terms.

### 2.2 Climate Adaptation Plans

I selected the Tribal CAPs first as there is a limited number available. The National Congress of American Indians, the oldest and largest American Indian organization, and the Pacific Northwest Tribal Climate Change Project have comprehensive inventories of Tribal climate assessments and adaptation plans (*Adaptation Plans* | *Tribal Climate Change Guide*, n.d.; *Climate Change* | *NCAI*, n.d.). Many of these documents have been developed by individual Tribal nations, while others have been created in collaborative efforts by inter-Tribal organizations. I avoided plans that were created by consultants on behalf of Tribes to try to narrow down adaptation plans that were written by Tribal members. The significance of a CAP written by Tribal members is that it may better reflect how the Tribe views climate adaptation planning than if it was written by an external organization. There is an assumption in this that the



CAP encapsulates the Tribe's perspectives on adaptation planning. There are clear limitations to this assumption, as any organization is comprised of unique individuals with independent attitudes, opinions, and biases that may not align with the organization's statements.

Additionally, it is worth noting that the Tribes likely have additional views on the subject that were not publicly included in their plans.

I searched for documents that were specifically climate change adaptation plans by Tribes in the northeastern United States. Two of the CAPs available through these sources, the Shinnecock Indian Nation Climate Change Adaptation Plan and the Climate Change Adaptation Plan for Akwesasne, were from Tribes based in the northeast. Subsequently, I selected two non-Tribal CAPs to compare to the plans created by the two Tribes. They were selected based on a review of neighboring municipalities which had climate change adaptation plans available. Albany, New York is the municipality most geographically comparable to the Saint Regis Mohawk Tribe with a CAP publicly available. Like the Saint Regis Mohawk Tribe, Albany is also located along a river, the Hudson, in the northern portion of the state of New York. For a comparison to the Shinnecock Indian Nation's plan, the climate change adaptation plan for the boroughs of Brooklyn-Queens in New York City was selected. The Brooklyn-Queens plan is a section of a larger CAP for the city. These boroughs are located at the head of Long Island, along the coast of the Atlantic Ocean, and the Shinnecock Nation's Tribal land is at the other end of coastal Long Island. These geographic and environmental details are significant because the pairings will face similar climate change hazards (i.e., sea level rise, inland flooding, temperature variability, etc.).

## 2.3 Literature Review and Key Terms

For the literature review, I collected peer-reviewed articles, chapters, and other media relevant to the research questions. The literature falls mainly within the fields of law, sustainability, planning, and climate science. My search terms included “climate change adaptation,” “Indigenous planning for climate change,” “Indigenous adaptation planning,” “American Indian Tribes and adaptation,” “American Indian land use,” and “Indigenous climate action plans.” I also searched for grey literature on Indigenous climate adaptation planning from institutional sources, including the Intergovernmental Panel on Climate Change (IPCC), National Congress on American Indians (NCAI), National Oceanic and Atmospheric Administration (NOAA), and the U.S. Environmental Protection Agency (EPA).

Reviewing relevant literature revealed three key terms for my content analysis: systems, resources, and vulnerabilities. These three terms are significant in that all four of the CAPs discuss systems, resources, and vulnerabilities, but in distinctive ways. In general, CAPs tend to identify at a high level 1) what systems and sectors will be impacted by climate change, 2) who or what is perceived as the most vulnerable (i.e. buildings, people, ecosystems) to climate change, and 3) what resources need to be protected or engaged to mitigate risks and vulnerabilities. I used these key terms as codes for my analysis. I explain how I selected the key terms as part of the introduction to the content analysis in Chapter 5.

## 2.4 Content Analysis

Content analysis is “the study of recorded human communications” (Babbie, 2013: 295). Content analysis has been used by researchers to study a breadth of materials, such as books, poems,

letters, laws, and websites. As Babbie (2013) phrases it, content analyses can be best applied to answer questions of “who said what, to whom, why, how, and to what effect?” (296).

A content analysis was used to learn Tribal priorities in adaptation planning, how these priorities are communicated through their plans, and how their plans are unique from non-Tribal adaptation plans. There are two approaches used to analyze the text: manifest and latent content analyses. Manifest content analyses focus on what is immediately visible in the text by quantifying the number of times a category of word or phrase appears (Stemler, 2001). From the initial manifest analysis quantification, I then investigated how each of the terms appeared in the text through a latent content analysis. The latent content analysis searches for underlying meaning surrounding the context of the words as they appear (Stemler, 2001).

This thesis generally follows the methods put forward by Krippendorff (2019) for conducting a content analysis, including 1) selection of both Tribal and non-Tribal climate adaptation documents based on defined criteria, 2) a thorough reading and organization of the climate adaptation documents, 3) a list of coded topics, 4) quantification of the phrases for each coded topic as it appears in the text (manifest content analysis), and 5) qualitative analysis of the coded topics in both the Tribal and non-Tribal plans to interpret their contextual framing (latent content analysis).

There may be an issue of subjectivity inherent to the process, because latent content analyses involve individual interpretation of meaning (Babbie, 2013). Graneheim et al. (2017) argue that when abstraction and interpretation are used to a high degree to inform the construction of categories and themes, there is a greater need to demonstrate the validity of the analysis. This research works to address these concerns by incorporating a literature review and background on

the Tribes, as well as by employing both manifest and latent content analysis methods together to expand how the coded topics were chosen and how they will be analyzed in the text.

## 2.5 Limitations

There are limitations to this thesis and its execution, and better approaches likely exist with greater time and resources available. This thesis began in 2021 amid the COVID-19 pandemic, when travel and in-person meetings were exceedingly difficult, if not impossible. American Indian Tribes were stretched thin working to provide the necessary health, social, and economic resources to get their communities through this national emergency (Wilson et al., 2020). Given these circumstances and my standing as a non-Indigenous person, my intention with this thesis has been to analyze publicly available materials without asking for the energy or time of Tribal governments during this difficult time. Because the scope of this thesis does not include hearing directly from the Tribes or local governments who drafted the documents, this thesis does not speak on behalf of these entities and is largely driven by my interpretation of the language used. I recommend that future research on this subject include interviews alongside the content analyses to better uncover the intentions and perspectives behind the production of the documents.

## Chapter 3: Literature review

### 3.1 Introduction

This thesis is at the intersection of two multifaceted topics: Tribal land planning and climate change adaptation. There are multiple factors that have contributed to Tribes producing adaptation plans to prepare their communities for climate change. Such factors include the changing climate itself, the history of contested American Indian sovereignty and self-

determination, and Tribal land management. This literature review sets a foundation of what scholarship is saying about these converging topics, which will inform the key terms used in the content analysis and the larger discussion on the findings.

Overall, the literature conveys that Indigenous communities have contributed very little to climate change and yet are particularly at-risk to climate change impacts (Galloway McLean et al., 2009; Hepler & Kronk Warner, 2019; Jantarasami et al., 2018; Krakoff, 2007; Warner, 2015; K. Whyte, 2013). Climate change is a severe ecological challenge principally brought about by settler-colonial governments, especially the United States (Whyte, 2013). The complex relationship between American Indian Tribes and the settler colonial United States can compound the impacts of climate change on Tribes (Ford & Giles, 2015). Tribal sovereignty is important in climate adaptation efforts (Hui, 2020), and Indigenous communities may assert self-determination by creating adaptation strategies rooted in local values and community knowledge systems (Krakoff, 2011).

### 3.2 Impacts of Climate Change on Tribal Nations

Climate change refers to the gradual alteration of the planet's interconnected systems, which has largely been caused by human activities and development patterns, particularly the increasing emission of greenhouse gases including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, and others (Ford & Giles, 2015; IPCC, 2014; Krakoff, 2007). As pollutants have compounded and begun to change earth's systems, climate change has become an issue of immense importance for current and future generations (Krakoff, 2007). The ensuing change in global climatic systems includes air current disruptions, oceanic acidification, and increased land and water temperatures (IPCC, 2014; Pörtner et al., 2022).

Literature claims that climate change is threatening the survival of Indigenous communities (Galloway McLean et al., 2009; Hepler & Kronk Warner, 2019; Jantarasami et al., 2018; Krakoff, 2007; Warner, 2015; K. Whyte, 2013). Indigenous peoples living within settler-colonial mainland United States, known as American Indians, cover a wide span of geographies and histories. American Indian Tribes practice a range of cultural and political traditions and face varying threats from climate change. However, there are common themes noted in the literature as to the impacts of climate change on American Indians, such as threats to traditional foods, water resources, Tribal economies, and community infrastructure (Jantarasami et al., 2018; Norton-Smith et al., 2016). Such threats include climate-related hazards such as land loss caused by rising sea levels, flooding, drought, erosion, permafrost thawing, and increasing impacts from storms (Jantarasami et al., 2018).

Literature has noted that American Indian relationships with the places they frequent have shaped their cultures and spiritual practices (Hibbard et al., 2008; Krakoff, 2007; Morishima, 2018). Indigenous ties to places may also intersect with their economies, as their traditional livelihoods can depend on natural resource availability and seasonal trends. Thus, the shift in environmental conditions caused by climate change threatens the interlinked systems of culture and economy of Indigenous peoples (Jantarasami et al., 2018). Climatic shifts also signify a threat to sacred and historically significant sites for Indigenous peoples, impacting cultural traditions (Ford & Giles, 2015).

Tribes are already experiencing the impacts of climate change on their food and water systems. Midwestern Tribes have noticed declining maple syrup production. Southwestern Tribes report droughts that damage livestock and agriculture. In the Northeast, Tribes report reduced blueberry

and shellfish harvests due to changing terrestrial ecosystems and oceanic conditions (Ford & Giles, 2015). Literature asserts that Indigenous communities may depend on local plants, fungi, and animals for more than just food; other organisms can be medicine, community, and aspects of Tribal tradition (Lynn et al., 2013; Voggesser et al., 2013). The loss of life and places important to Indigenous traditional cultures compounds the historical and ongoing systemic pressures of colonization (Cordalis & Suagee, 2008).

### 3.3 Tribal Sovereignty and Self-Determination

The United States is a “settler state,” formed by colonialization through the occupation of foreign land and the dispossession of non-white persons, resulting in new governance (Hibbard et al., 2008). American Indians have a unique legal status with the United States government that is the legacy of a body of federal laws, including treaties, Congressional acts, executive policies, and federal court decisions. The United States and federally recognized Tribes have a government-to-government relationship (Krakoff, 2007). The Marshall Trilogy, a series of Supreme Court cases, established Tribes as self-governed, domestic dependent nations (*Johnson v. McIntosh*, 21 U.S. 543 (1823); *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831); *Worcester v. Georgia*, 31 U.S. 515 (1832)). The cases created a dynamic where Tribal nations exist as independent sovereignties inside of the territorial boundaries of the United States (Hepler & Kronk Warner, 2019; McNeeley, 2017).

Generally important principles of American Indian governance include that Tribes retain inherent sovereign authority over their members and lands, Congress holds plenary over Indigenous affairs, and the federal government has a trust responsibility (Cordalis & Suagee, 2008; Wood, 1994). The United States establishment of trust responsibility in the 19<sup>th</sup> century

created a legal and fiduciary obligation to financially support and provide education, health, safety, and environmental protection essential services to Tribal nations (Lobo et al., 2010). Trust responsibility created a relationship where allotted Indian American reservation lands are held “in trust” by the federal government, with Tribes or individuals as beneficiaries (Ford & Giles, 2015). Tribes have access to natural resources on their lands, and some Tribes have specific hunting, fishing, and gathering rights off the reservation land as well (Jantarasami et al., 2018).

Following the 1800s Allotment Act and the 1950s Termination Act, federal American Indian policy shifted into the self-determination era (Ford & Giles, 2015; Lobo et al., 2010; McNeeley, 2017). Self-determination refers to “the ability to self-govern and have decision-making authority about natural resources, like water, land, and food” (McNeeley, 2017: 395). This era began in the 1960s with the rise of Indigenous activism and gained momentum through the passage of the Indian Self-Determination and Education Assistance Act of 1975 (Lobo et al., 2010). Autonomy through self-determination is central to Indigenous activism (Hibbard et al., 2008). When the U.S. Government acts without accountability to trust assets or without consulting Tribes as sovereign governments, the U.S. is limiting Tribal self-determination. Historically, the state and federal governments of the United States hindered Indigenous peoples’ right to self-determination through acts of violence, namely forced relocation, dispossession, brutal assimilation policies, and termination of protections (Ford & Giles, 2015). Impediments to self-determination may worsen with climate change (Galloway McLean et al., 2009; Jantarasami et al., 2018).



Many Tribes remain unrecognized by the federal government, which obstructs their access to resources needed for governing with self-determination (Morishima, 2018). There are Tribes recognized on a state level (National Conference of State Legislatures, 2016), but not federally, as well as Tribes that are not recognized at all by the United States. Recognition level has implications as to how the federal and state governments consult with Tribes on climate issues and what funding options are available to Tribes (Jantarasami et al., 2018). As posed by Susskind & Anguelovski (2008) in consideration of Indigenous land management, “Adaptation... begs the question: How can Indigenous people survive in the context of a dominant culture that does not allow them to remain true to their traditional values or way of life?” (4).

### 3.4 Tribal Traditional Knowledge

Traditional ecological knowledge (TEK) refers to research, observation, and learning carried out over generations by Indigenous peoples with plants, animals, natural phenomena, and landscapes of the places they exist (Hui, 2020; Jantarasami et al., 2018). TEK characterizes humans as inextricably bound up in, connected to, and dependent upon relationships with natural, non-human beings and elements (Krakoff, 2007). TEK is becoming increasingly acknowledged in literature as a tool for addressing climate change because of its historic use by different Indigenous communities for adapting to environmental fluctuations (Hepler & Kronk Warner, 2019; Hosen et al., 2020; Nakashima et al., 2012; Norton-Smith et al., 2016; Turner & Spalding, 2013; Williams & Hardison, 2013). Indigenous scholar Kyle Whyte (2018) expands on traditional knowledges and the reciprocal relationships some Indigenous peoples have with the natural environment. According to Whyte, the relationships between some Indigenous peoples and other beings, both human and non-human, are based on responsibilities. These moral relationships may form complex systems that support resilience and adaptation:

The moral relationships of responsibility are not trivial. They facilitated peoples' capacity to adjust to the dynamics of ecosystems to avoid preventable harms... Moral qualities of responsibility facilitate resilience. High levels of trust, consent, and reciprocity allow us to rely on each other transparently and productively when faced with environmental changes. (Whyte, 2018: 140)

Some Indigenous communities may keep traditional knowledges within their community with limited access allowed to outsiders to avoid exploitation of the knowledge (Morishima, 2018; Turner & Spalding, 2013). Consequently, this thesis will not delve into TEK strategies beyond a general explanation as to how TEK is employed for adaptation.

### 3.5 Climate Vulnerability, Resilience, and Adaptation

#### 3.5.1 Vulnerability and Responsibility

In this thesis, vulnerability is referred to as how the Intergovernmental Panel on Climate Change (IPCC) (2014: 5) defines it: "The propensity or predisposition to be adversely affected."

Vulnerability is more than exposure to hazards. Vulnerability is also measured by the strength of the systems experiencing the hazard (Berkes, 2007). Brooks et al. (2005) suggest that vulnerability to climate change exists at the intersection of environmental change and socially constructed inequalities. There are many factors that can intensify vulnerability, such as regional location, socioeconomic variables, and shifting power relations. Historic development patterns contribute to vulnerability when they create obstructive land uses and poorly engineered landscapes. The greater access a community has to resources, the better they are able to prepare for and respond to disasters (Brooks et al., 2005).

Indigenous communities at-risk to climate change are often characterized as vulnerable in literature due to the external political and social forces that have limited their resources. Norton-Smith et al. (2016) warn that labeling Tribes as “vulnerable” can imply a lack of agency or competence. Vulnerability narratives can obscure the ways that Indigenous groups navigate environmental change with self-determination (Nicholas J. Reo et al., 2017). As Brown & Westaway (2011) assert, humans are never completely passive to environmental threats like climate change. The Tribal vulnerabilities that may exist are not inherent. Rather, vulnerabilities exist due to systemic and institutional barriers that limit their ability to act with self-determination.

Whyte (2013) argues that it is unjust for Indigenous communities in the United States to lack the resources they need for climate change adaptation. The structural barriers faced by Indigenous peoples in the United States are due to government removal, allotment, and homestead policies (McNeeley, 2017). The limited sovereign resources available to American Indians has resulted from the settler-colonization practices of the United States (Hui, 2020). Generations of colonial policies and continuous settler expansion weakened, though not defeated, Tribal resistance to the political order, institutions, and private companies of the United States. After decades of the United States government upending and dissolving their political cultures, Indigenous communities in the United States are often forced to depend on the same institutions responsible for the violence committed against them (Lobo et al., 2010; K. Whyte, 2013). Simultaneously, settler-colonial governance brought about severe ecological challenges to which Indigenous peoples did not significantly contribute. Regardless of their lack of contribution to climate change, Indigenous peoples are dealing with climate change challenges or face the loss of their

lands and ways of being. As various actors work with Tribes on climate adaptation, Whyte (2013) notes that they cannot dismiss the injustices affecting Tribes:

While no one individual or agency can eliminate the injustice in question, responsibility nonetheless remains. Insofar as these leaders, scientists and professionals work with or for tribes, they are responsible to do what is in their power to address the coupled political obstructions and ecological challenges of adaptation. (523)

Whyte (2013) suggests policy approaches that operate as “systems of responsibilities” for non-native actors: working to support Indigenous communities beyond basic compliance, honoring the government-to-government relationship, upholding the trust responsibility the federal government has to Tribes, integrating Tribal and non-Tribal sciences, and developing multiparty governance. Actions can become priorities in Tribal adaptation when they account for systems of responsibilities (Whyte, 2013).

Although Indigenous communities face many external obstacles to adaptation, there are also factors that lend well to their adaptive capacity. Reservations tend to have less developed built environments, thus limiting infringement on the surrounding ecosystems and enabling greater environmental resilience (Damon, 2018). Damon (2018) notes that Indigenous communities may share resources and support so that when disaster does strike, they are better able to recover.

### 3.5.2 Resilience and Adaptation

Resilience is “the capacity of a system to absorb recurrent disturbances, such as natural disasters, so as to retain essential structures, processes, and feedbacks” (Berkes, 2007: 283). Resilience is a

process and there are four main factors that contribute to it as emphasized by Berkes (2007). Factors include opportunities for autonomy in organization, living with change, ecological, social, and political diversity, and problem-solving strategies (Berkes, 2007).

The IPCC (2014: 5) defines adaptation as the “process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.” Examples of adaptation strategies include approaches like building infrastructure and hard engineering (Esteves, 2014), cultural traditions (Daigle et al., 2019; Hosen et al., 2020), or managed retreat (Marino, 2018). Adaptation strategies rely upon the capacity for an entity, in this case Tribes and non-Tribal governments, to prepare for and respond to climate change (McNeeley, 2017). Some literature characterizes traditional knowledge as a tool that may support socio-ecological resilience during environmental change (Hosen et al., 2020; Turner & Spalding, 2013).

### 3.6 Tribal Land and Reservation Planning

Due to issues around sovereignty and self-determination, American Indian communities face economic, social, political, and legal constraints that limit their ability to respond to environmental shifts (McNeeley, 2012). Historically, the United States government has had vacillating stances on how Tribal nations may govern and manage their lands (Ford & Giles, 2015; Wood, 1994). In the 19<sup>th</sup> and 20<sup>th</sup> centuries, the United States maintained policies that removed Indigenous peoples from their land, sold their land to white colonial settlers, and left many American Indians without land at all (McNeeley, 2017). The Dawes Act (1887) and the Indian Reorganization Act (IRA) (1934) created a fractioned checkerboard of reservation land

ownership. This checkerboard pattern is created by selling plots of allotted Tribal land to non-Indigenous persons (*Dawes Act*, 1887; *Indian Reorganization Act*, 1934), thus fragmenting the communities on reservations. The Dawes Act, otherwise known as the Allotment Act, initially created the checkerboard pattern of land ownership and, when the IRA reinstated the reservation system, cemented the pattern (*Dawes Act*, 1887).

Today, differing land use and ownership statuses, as well as the multiple layers of governance, causes additional complications in planning adaptation measures for American Indian reservation lands (Ford & Giles, 2015). Another institutional barrier is federal evidentiary rules, which do not allow oral history to establish legal claims (H. M. Babcock, 2012). Often, oral stories are the best evidence for Indigenous persons to make successful land claims. Limited access to traditional territory and cultural resources are also prominent barriers to Indigenous land management (Jantarasami et al., 2018). Ownership statuses, layers of governance, federal evidentiary rules, and limited access to traditional territory made land management difficult on reservations long before climate change was ever part of the conversation.

Today, like non-Tribal communities, Tribal nations exercise planning governance through codes, such as land use and zoning ordinances (Hibbard et al., 2008). Tribes have full authority to regulate their lands and resources through land use planning. Court cases such as *Montana v. United States* (1981) (*Montana v. United States*, 1981), however, have forced Tribal nations to continue to justify regulatory authority over their reservation lands. This has been achieved through demonstrating that an activity threatens a core of self-determination, including political integrity, economic security, health, and welfare. Climate change threatens Tribal existence and self-determination. (Ford & Giles, 2015)

### 3.7 Tribal Climate Adaptation Planning

Self-determination is a paramount issue in Tribal land management and adaptation. McNeeley (2017) uses a sustainable climate adaptation framework to show the power relationships and knowledge pathways that are foundational to Tribal adaptation. In order for adaptation to take place, an entity must have the authority to make decisions and the flexibility to respond to the impacts. Tribal decision making and agency are important to maintain sovereignty in climate adaptation efforts (Hui, 2020). Indigenous communities may assert self-determination through climate adaptation planning by creating adaptation strategies rooted in local values and community knowledge systems. Krakoff (2011) explores the conditions necessary for Indigenous communities to consider adaptation. Krakoff found that monetary and technical support are necessary but not sufficient for fully supporting Indigenous adaptation. Instead, Krakoff offers Indigenous self-governance, and the inherent right to self-determination, as a way of “strengthening the community’s ability to ride that rough wave” that is climate change (Krakoff, 2011: 212).

As Tribes consider their options for adaptation, there is often uncertainty as to who is responsible for decision making. Uncertainty is due to the conflicting sovereigns regulating the Tribal community: the Tribe, the federal government, and the relevant state government (Warner, 2015). Additionally, because Tribal governments organize themselves in a diversity of ways, with unique laws, traditions, and practices, a one-size-fits-all approach to Tribal adaptation strategies is largely inadequate. This makes localized, small-scale action on climate change crucial (Morishima, 2018). Tribes vary tremendously in their capacities for climate adaptation and frequently rely on outside partners for technical support (McNeeley, 2017).

Inadequate support from the federal and state governments in addressing the unique concerns of Indigenous communities is one of the most pervasive and difficult barriers to adaptation for Tribes. The Bureau of Indian Affairs and federally recognized Tribes have historically received substantially less funding than other Department of the Interior entities (Morishima, 2018). Tribes may have to compete with state and local governances for limited funding opportunities, and funding often excludes Tribes altogether (Norton-Smith et al., 2016). Because Tribes may not have the capacity to pursue many grants, they may need to depend on limited, temporary grants (Hui, 2020).

### 3.7.1 Tribal Adaptative Knowledge

Indigenous knowledges are as diverse as the communities and ecosystems with which they exist (Cochran et al., 2013). Indigenous knowledges, while diverse, often include systems of responsibilities that communities have developed in relation to other beings, such as “webs of interspecies relationships” (Whyte, 2013: 518). Literature indicates that Indigenous traditional knowledge can support the development and advancement of comprehensive climate adaptation strategies (Daigle et al., 2019; Hosen et al., 2020; Norton-Smith et al., 2016; Turner & Spalding, 2013). An example of this is the Climate Change Adaptation Plan for Akwesasne, which is structured following the Mohawk Thanksgiving Address (Saint Regis Mohawk Tribe’s Environmental Division, 2013). Additionally, from Whyte (2018), “Anishinaabe storytelling on migration and wild rice tell us how the people adapted to new environments by developing moral relationships, including responsibility, spirituality, and justice, which are at the heart of how we understand resilience” (137).



Many adaptation strategies are beginning to receive funding, with some already in the early stages of implementation (Jantarasami et al., 2018). Documented approaches to adaptation can include conducting vulnerability assessments and drafting climate adaptation plans, as well as capacity building measures. The Fourth National Climate Assessment by the U.S. Global Climate Change Program categorized Tribal climate change adaptation projects into the following categories: planning and assessment, adaptation and implementation, monitoring and research, governance and capacity building, and youth engagement and cultural continuity. (Jantarasami et al., 2018)

Norton-Smith et al. (2016) describe Tribal climate adaptation plans as typically combining climate projections with traditional knowledges to understand localized vulnerabilities. The plans are often regarded as works in progress rather than finished products. Indigenous legal scholar Elizabeth Ann Kronk Warner (2015) examined Tribal climate adaptation plans to identify emergent trends. She looked at the climate change plans of four Tribes, based in the western portion of the settler-colonial United States. Kronk Warner concluded that all four Tribes emphasized Tribal culture and the impacts of climate change on traditions within their plans. Three of the four plans touch on the necessity of coordination with local governments and community, TEK, and resiliency.

### 3.8 Conclusion

This literature review informs the content analysis by identifying the most important aspects of Tribal land management and adaptation, such as sovereignty and accessible resources, as well as the consistent issues across the field of climate change planning, including identifying vulnerabilities and building resilience. The literature suggests that Tribal plans are likely to adopt

what can be described as a “relational” approach to climate change, including social networks (Pelling & High, 2005) and moral relationships of responsibility (Whyte, 2013, 2018). This relational approach may emphasize adaptation strategies that are derived from and function to support practices that Tribes consider to be grounded in their respective cultures, following Kronk Warner’s (2015) findings that four western Tribal adaptation plans focus on impacts to culture and traditions. By comparison, the literature suggests that non-Tribal climate adaptation plans will prioritize recommendations for hard infrastructure and preservation of the built environment (Esteves, 2014).

From reviewing the literature on Indigenous climate change responses, I am concerned by the framing of Indigenous TEK systems as data to better arm non-Indigenous climate change planners (Turner & Spalding, 2013). This framing mirrors the broader extractive characteristics of settler colonial governance and shirks settler colonial governance’s responsibility for ongoing harm to the natural environment, which has led to the ecological crisis of climate change. In essence, it is crucial for non-Indigenous planners to recognize the responsibility that is intimately bound with their gaze on Indigenous ways of living.

## Chapter 4: Background

This thesis lies at the intersection of two complex topics: climate change adaptation and Tribal planning. The literature review described some of the historical and contemporary forces that have led to the current states of climate change, Tribal governance, and Tribal climate change adaptation planning. American Indian Tribal lands and regulatory powers have been historically contested and obstructed. As shown in this chapter, Tribal climate adaptation plans are significant tools for informing land planning and regulation.

This background chapter expands on how each of the four climate adaptation plans were developed by agencies with distinct perspectives on how the documents are to be used. The Shinnecock Nation and the Saint Regis Mohawk Tribe have developed their plans within circumstances specific to their respective histories, geographies, and institutional relationships. This background information situates the Tribal plans within regional, comparative data on climate change. The aim of this information is to contextualize the plans and their respective Tribal governments within the changing climate of their region. Lastly, the four CAPs were written in 2013 and there has been time since then for climate adaptation initiatives to unfold. I describe some of the ways that the two Tribes are addressing climate change outside of their CAPs to highlight the strategies they have undertaken.

#### 4.1 Climate Adaptation Plans

The EPA defines climate adaptation as “taking action to prepare for and adjust to both the current and projected impacts of climate change” (US EPA, 2021). There are various entities, such as local municipalities, regional and county governments, states, Tribes, and even agencies within a government, that may want to start planning for climate change. As part of the planning process, governments may choose to draft climate adaptation plans (CAPs) (Georgetown Climate Center, n.d.). While there are no regulatory requirements concerning how climate adaptation plans are drafted or what they need to contain, CAPs often share common features. These include:

- 1) Description of the geographic area
- 2) Description of the current climate and hazards of that area (i.e. coastal storm surge, inland flooding, fire seasons)

- 3) A list of the aspects of the area that will be examined (i.e. transportation, environment, energy, communications)
- 4) Projections for how climate change will impact the area (i.e. sea level rise, coastal erosion, intensified fire seasons)

CAPs can set benchmarks and goals for a governing entity, but they do not have regulatory or legal authority alone. Rather, they can inform decision making or be codified through regulation, such as zoning, permitting, and land ordinances. An example of how CAPs can be used by local governments, Boston issued a series of CAP reports as “Climate Ready Boston,” focused on hazards that include extreme heat and flooding. One report focuses on solutions specific to the Dorchester neighborhood with a section on “regulatory considerations” (City of Boston, 2020: 164). According to the report, building-level adaptation guidelines can be incorporated into existing zoning through a “Coastal Flood Resilience Zoning Overlay District,” therefore requiring heightened standards for new development within a particularly at-risk area. Drafting CAPs may also help local governments or Tribes identify other planning items they may require, such as a hazard mitigation plan or a risk and resiliency assessment.

#### 4.1.1 Federal Opportunities

CAPs cannot be used to secure federal funding in isolation. However, they can be used as supportive documentation or integrated into other materials for funding applications. For example, adopted and current hazard mitigation plans are required for funding opportunities through FEMA. As of 2021, 228 Tribal governments had approved Tribal hazard mitigation plans (FEMA, 2021). To receive Federal Emergency Management Agency (FEMA) funding, hazard mitigation plans must include climate change adaptation planning. Providing a CAP as part of a grant application may verify that the local government or Tribe has sufficiently

considered the impact of climate change on their area, if within FEMA's requirements.

Additionally, FEMA's grant process requires local governments and Tribes to present a benefit cost analysis showing their present risk and how grant funding can reduce such risk and save resources in the future. The process of creating a CAP can help the applying government, including Tribes, understand their risks and vulnerabilities for the benefit cost analysis. (FEMA, 2021)

FEMA's Building Resilient Infrastructure and Communities (BRIC) program seeks to support state, local, Tribal, and territorial governments in proactive investment in community resilience to hazards. In 2021, in response to Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, the funds set aside for Tribal communities increased from \$20 million to \$25 million (FEMA, 2021). These federal opportunities are significant in that there is increasing means for Tribal governments to prepare their communities for climate change impacts. By developing climate adaptation plans, such as the ones analyzed in this thesis, Tribal governments are not only creating a roadmap to resilience; they are also opening up new funding opportunities to enact adaptation measures.

## 4.2 Summaries of Plans

Essential to understanding the language used in the four CAPs is identifying the who, what, and why of the documents. As this thesis analyzes the language employed in the plans, the author and their intention affect the language used. For example, if a plan is written by the economic development agency of a city, the authors may focus largely on financial incentives, businesses, or economic systems. The following summaries include an overview of what agency within the Tribe or municipality created the document and how the plans frame the intent behind their production. The plans are organized by pairing the selected American Indian CAP with the

respective neighboring non-Tribal plan. Each of the following plans I selected are from 2013, subsequent to Hurricane Sandy's impact on the northeast and the year when the Obama Administration issued a series of climate preparedness tools and information for state, local, and Tribe action on climate change (Office of the Press Secretary, 2013). Although I chose the non-Tribal plans after the Tribal documents, all the plans are objects of my analysis, and each is analyzed through the ensuing content analysis.

#### 4.2.1 Akwesasne and Albany Plans

##### *Climate Change Adaptation Plan for Akwesasne (2013) by the St. Regis Mohawk Tribe*

The Saint Regis Mohawk Tribe's climate change adaptation plan focuses on the Mohawk Nation Territory, known as Akwesasne (Saint Regis Mohawk Tribe's Environmental Division, 2013). The Saint Regis Mohawk Tribe's Environmental Division drafted the document. The plan describes the impacts of climate change on the resources, assets, and community of the Akwesasne reservation. The plan also integrates recommendations as to how the Tribal nation can adapt to these projected impacts. The Environmental Division sees this adaptation plan as the first step in the climate change adaptation process:

The Saint Regis Mohawk Tribe's (SRMT) Environment Division is investigating the impacts of climate change on the resources, assets, and community of Akwesasne and is developing recommendations for actions to adapt to projected climate change impacts. This plan is a first step in an effort to develop practical actions that the Tribe can take in order to adapt to ongoing and expected climate changes. (Saint Regis Mohawk Tribe's Environmental Division, 2013: 1)

*Albany Climate Change Vulnerability Assessment and Adaptation Plan (2013) by the City of Albany, New York*

The “Albany Climate Change Vulnerability Assessment and Adaptation Plan” was produced by the Mayor’s Office of Energy and Sustainability. The city of Albany is in northern New York, south of Akwesasne. The Albany plan analyzes how climate change could affect the people living in Albany, including the infrastructural and natural resource impacts. The report provides recommendations and strategies as to ways of adapting to climate change. This is described in the report as improving “the city’s resilience and adaptive capacity” (Mayor’s Office of Energy & Sustainability, 2013: 9). The report is characterized as the first step for Albany to prepare for climate change impacts. (Mayor’s Office of Energy & Sustainability, 2013)

4.2.2 Shinnecock Indian Nation and Brooklyn-Queens Plans

*Climate Change Adaptation Plan (2013) by the Shinnecock Indian Nation*

The Shinnecock Environmental Department and the Nation’s Natural Resource Committee created the Shinnecock “Climate Change Adaptation Plan.” The Shinnecock Nation is located on the South Fork of Long Island and is surrounded by Southampton, New York. The report cites Tribal shellfish cultivation and tree loss as primary motivators in investigating climate change adaptation for the Nation. The report includes a list of goals and actions, as well as a description of who will lead the implementation of adaptation efforts. (Shinnecock Environmental Department & Natural Resource Committee, 2013)

*A Stronger, More Resilient New York, Brooklyn-Queens Waterfront Chapter (2013) by the City of New York, New York*

The “Stronger, More Resilient New York” report is a comprehensive plan on how to rebuild communities that were impacted by Hurricane Sandy to make these communities more resilient. Brooklyn-Queens are located on the western end of Long Island, New York. The report is, in essence, a vulnerability assessment and climate change adaptation plan for the entirety of New York City (NYC). It was created by the NYC Special Initiative for Rebuilding and Resiliency, which was specifically created to identify how to improve infrastructure and rebuild for resiliency. The Brooklyn-Queens Waterfront Chapter is a plan on how to rebuild what was damaged or lost in these communities along the waterfront, and how to implement techniques that strengthen these communities to future environmental hazards, such as those associated with climate change. (NYC Special Initiative for Rebuilding and Resiliency, 2013)

#### 4.3 The Tribal Governments

The Saint Regis Mohawk Tribe and the Shinnecock Indian Nation are both located in the northeastern region of the settler-colonial United States, on ancestral land that is now referred to as New York State. They are both federally recognized Tribes that deal with New York and the U.S. in government-to-government relationships (Indian Affairs Bureau, 2021). Both Tribes hold reservation lands on parts of their ancestral homelands that they plan and operate as sovereign nations. (Saint Regis Mohawk Tribe, n.d.; Shinnecock Environmental Department & Natural Resource Committee, 2013)



#### 4.3.1 Saint Regis Mohawk Tribe



Figure 1. Akwesasne binational reservation (Source: Climate Change Adaptation Plan for Akwesasne)

#### *Geography and History*

The Saint Regis Mohawk Tribe reservation is positioned in the St. Lawrence River Valley (Figure 1). The Saint Regis Mohawk Tribe, a division of the larger Mohawk Tribe, reservation has a population of approximately 3,491 persons (U.S. Census Bureau, 2021). The Tribe is proximate to several other smaller rivers as well as major wetlands. Their ancestral lands surround this area in upstate New York, spreading to southern Canada and Vermont. The reservation is at the intersecting borders of southeastern Ontario, southwestern Quebec, and the northern border of the State of New York. This binational territory is referred to by its Mohawk name, Akwesasne, which means “Land Where the Partridge Drums” (New York Heritage Digital Collections, n.d.). Historically, the Mohawk were the keepers of the Eastern Door of the Iroquois Confederacy, meaning they are the easternmost division of the Iroquois nation and would fight to

defend the Iroquois territory. Over the 18<sup>th</sup> and 19<sup>th</sup> centuries, additional Mohawk community members joined Akwesasne, as well as a band of Abenakis and refugees from the Oswegatchie Mission. The peoples of varying Tribes who joined this area eventually became known collectively as the peoples of the Akwesasne, which included the St. Regis Mohawk Tribe. This location was also beneficial in negotiations with fur traders in Albany and Montreal, giving them greater economic influence among other Tribes. (Saint Regis Mohawk Tribe, n.d.; Saint Regis Mohawk Tribe's Environmental Division, 2013)

### *Inter-Governmental Relationships*

In the late 1700s, the Indigenous peoples living in Akwesasne claimed the expansive land surrounding the St. Lawrence River. Through a treaty signed by the representatives of the Seven Nations of Canada and the State of New York, the Mohawks living in St. Regis were allocated a small parcel in New York as their reservation. Today, the people of Akwesasne claim their ancestral land outside of their allocated reservation territory. Mohawk peoples can travel freely through Akwesasne, across the international border between the U.S. and Canada (Kanentakeron Mitchell, 1969). It was not until the mid-1960s that the Mohawks living in New York State were federally acknowledged and invited into a formal relationship with the United States. Today, the Saint Regis Mohawk Tribal Council Chiefs set policy and regulations for the Tribe. The State of New York and the United States governments deal with the Tribal Council government-to-government and, since 1973, the Tribe has received funding from both for Tribal programming. (Saint Regis Mohawk Tribe, n.d.)

The relationships between the Saint Regis Mohawk Nation, the state government, the federal government, and the non-Indigenous public is generally stable, but not without occasional

contention. In 1929, a private hydropower developer built an eleven-foot dam within the St. Regis watershed, disrupting the annual salmon run from the St. Lawrence River through the St. Regis River. The dam deprived Saint Regis Mohawk citizens of access to the salmon, a staple food (Graham, 2016). In 2016, after the Tribe applied for support, the Federal Energy and Regulatory Commission (FERC) dismantled the dam, reconnecting the 275 miles of river needed for the fish migration (Racey, 2016; Rosenthal, 2016).

Additionally, In the 1950s, the United States and Canada allowed large industrial facilities, including General Motors, to pollute the Saint Lawrence River watershed and forego adequate clean-up when the facilities closed. The factories leaked hazardous substances that accumulated in the water, soil, plants, and wildlife of the watershed (NOAA, 2021). The watershed became one of the most polluted areas in North America, impacted vital natural resources that the Mohawk community depends on (Whyte, 2018). The harmful legacy of this pollution is still significant to the Tribe. The Tribe has a robust Environmental Division that includes air quality, natural resource damage assessment, and remediation and restoration programs (Saint Regis Mohawk Tribe, n.d.). The Environmental Division addresses the impacts of the pollution in their CAP:

Pollution from the General Motors and Alcoa facilities near Akwesasne has also impacted agriculture in the area. Today, some plants grown in gardens in Akwesasne are still contaminated from pollution by industrial plants upwind and upriver from the territory. (Saint Regis Mohawk Tribe's Environmental Division, 2013: 23)

#### *Current Impacts of Climate Change*

The region encompassing the Akwesasne is already experiencing the impacts of climate change, including observed increasing temperatures and precipitation, as well as snowfall decline in

Akwesasne (Saint Regis Mohawk Tribe's Environmental Division, 2013). Because of the binational, transboundary nature of Akwesasne, there are multiple institutional sources on how the area is currently impacted by climate change, in addition to the Climate Adaptation Plan for Akwesasne.

Since 1970, the annual temperature of New York State has risen about 2.4 degrees Fahrenheit. New York has seen an increase in average annual precipitation, which is causing more rain and snow in the winter with drier weather in the summer. Winter snow cover is decreasing. Spring begins a week earlier than it has historically and animal populations, such as birds and oceanic fish, have moved their residency steadily northward in the past few decades. (NYS Department of Environmental Conservation, 2014; NYS Energy Research and Development Authority, 2011)

In Quebec, the annual average temperature has increased by 2 degrees Fahrenheit from 1948 to 2016. Ice has broken up sooner and lakes have frozen later in southern Quebec, the regional area of the Akwesasne land. Annual precipitation in Quebec increased by 10.5% from 1948 to 2012.

In Ontario, which includes a small part of the Akwesasne land, there has been an even higher annual average temperature increase of 2.3 degrees Fahrenheit from 1948 to 2016. Ontario has seen annual precipitation increase by 9.7% between 1948 and 2012. (Bush & Lemmen, 2019)

#### *Projected Impacts of Climate Change*

Overall, the region surrounding Akwesasne expects an increase in temperatures and precipitation. The Climate Adaptation Plan for Akwesasne describes the projected impacts of climate change on the Saint Regis Mohawk reservation land:

Harmful effects [of climate change] that are relevant to Tribal communities may include decreased fish populations associated with higher air and water temperatures, reduced

abundance of certain medicinal plant species, shifts in tree species to higher elevations and more northern latitudes, and shifts in the ranges of other plant and animal species. At the same time, climate change does have the potential to create beneficial opportunities. For example, increased air temperatures have the potential to lengthen the growing seasons of medicinal plants, higher carbon dioxide concentrations in the air can enhance plant growth, and in some areas, the availability of water resources may increase as rainfall patterns shift as a result of climate change. (Saint Regis Mohawk Tribe's Environmental Division, 2013: 2)

There is variability in climate change projections, specifically temperature and precipitation estimates, based on the actions the world takes to reduce greenhouse gas emissions. Therefore, projections include an estimated range based on the severity of the scenario. The minimum estimate, the least severe impacts, represents a future in which significant action had been taken to address greenhouse gas emissions. The maximum estimate, the most severe impacts, is a scenario in which very little is done. (NYS Energy Research and Development Authority, 2011)

The Saint Regis Mohawk land, known as Akwesasne, overlaps New York State, Quebec, and Ontario. Because of the transboundary location of Akwesasne and the limited climate data they have publicly available, I gathered information from sources focused on New York, Quebec, and Ontario. The New York State Energy Research and Development authority (2011) predicts an annual average temperature increase of 1.5 (minimum) to 3.0 (maximum) degrees Fahrenheit across the state through the 2020s, compared to the average annual temperature in 1970. These estimates continue to increase upwards into the 2080s, when the average annual temperature is expected to be between 4.0 to 9.0 degrees warmer (NYS Energy Research and Development Authority, 2011). Quebec will see a 7.1% to 9.4% increase in annual mean precipitation for

2031-2050, depending on the severity of the emissions scenario (Bush & Lemmen, 2019).

Ontario expects annual mean temperature to increase anywhere between 2.7 to 4.3 degrees Fahrenheit from 2030 to 2050. Ontario will also see an increase in annual mean precipitation of somewhere between 5.5% to 6.6% from 2031 to 2050 (Bush & Lemmen, 2019).

### *Addressing Climate Change*

In 2011, the St. Regis Mohawk Tribe received funding from the U.S. Environmental Protection Agency to identify changes in climate and its impacts on cultural and natural resources. The Tribe partnered with other regional Tribes, including the Shinnecock Indian Nation, and the National Oceanic and Atmospheric Administration (NOAA) to understand historical land uses, changes from urbanization, and impacts of climate change on Indigenous ways of life.

Additionally, the Tribe conducted a climate data inventory to identify vulnerable cultural resources, which likely informed aspects of their Climate Adaptation Plan. (Youngblood, 2011)

The St. Regis Mohawk Tribe manages approximately 6,800 acres of forest, much of which are wetlands. Black ash, a tree with cultural significance for basketmaking for the Tribe, is anticipated to experience earlier budding and flowering, shorter winters, and decreased suitable habitat due to rising temperatures from climate change. These changes leave the trees at risk from late frosts, invasive plant species, harmful bugs infestations (namely the emerald ash borer), and vulnerability to disturbances. To address these concerns, the Tribe has worked with partners to explore managing and protecting black ash stands. (Climate Change Response Framework, 2017; Saint Regis Mohawk Tribe, 2023)

### 4.3.2 Shinnecock Indian Nation

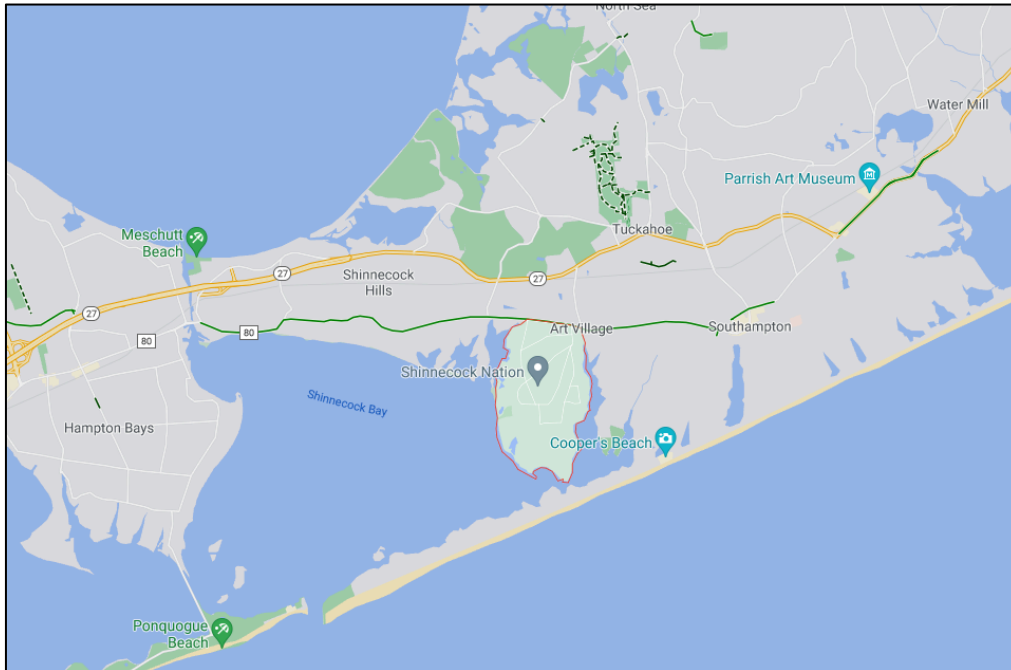


Figure 2. Shinnecock Indian Nation location (Source: Google Maps)

#### *Geography and History*

The Shinnecock Indian Nation inhabited a large area of what is now known as Long Island, New York. After the settler colonial expansion of the United States, Shinnecock Nation land has shrunk to a coastal 1.5-square-mile fraction of their historic area. Traditionally, when the Shinnecock people were able to move freely across large swaths of land, they adjusted their location according to the season, living close to the water in the spring and summer seasons before moving into the woodland areas for the rest of the year. The Shinnecock have traditionally spoken an Algonquian language and passed down their histories orally. In 1640, the first white settlers arrived in New York and the Shinnecock Indian Nation's land gradually diminished ever since. Currently, the Tribe has approximately 1,600 members. Of these members, 720 live on their traditional land, now referred to as the East End of Long Island – a peninsula predominately

at sea level. Today the Shinnecock Nation area is geographically constrained by the surrounding Southampton community. (Kilgannon, 2021; Weeks, n.d.)

### *Inter-Governmental Relationships*

The United States formally recognized the Tribe in 2010 together with obtaining trust status for a portion of their traditional lands (Nation

Figure 2) (Sengupta & Lawal, 2020; Shinnecock Environmental Department & Natural Resource Committee, 2013). In recent decades, the Shinnecock Nation has had tense relations with proximate non-Indigenous municipalities (Tucker, 1977). For example, in 2021, the Tribe sought recovery of 4.5 acres in Southampton, referred to as Sugar Loaf Hill, that held Tribal graves (Kilgannon, 2021). A moratorium was placed on any future development on the land through the Graves Protection Act, legislation established to prevent the disturbance of human remains in construction projects. Through collaboration with the Southampton Town Board and the Peconic Land Trust, the land was eventually returned to the Tribe for \$5.6 million (Kilgannon, 2021).

### *Current Climate Change Impacts*

The Shinnecock Indian Nation is already witnessing the effects of climate change unfold on their land (Shinnecock Environmental Department & Natural Resource Committee, 2013).

Regionally, temperatures in the northeast have increased by approximately 2 degrees Fahrenheit since 1970 (NYS Department of Environmental Conservation, 2014). As a coastal Tribe, the Shinnecock Indian Nation is at risk of coastal impacts such as sea level rise (Shinnecock Environmental Department & Natural Resource Committee, 2013). The Shinnecock Environmental Department and Natural Resource Committee have observed gradual creeping of salt water up the shoreline of their reservation, contributing to a significant loss of trees.



Additionally, as sea level rises, the water has begun to erode the reservation's shoreline (Shinnecock Environmental Department & Natural Resource Committee, 2013).

The Shinnecock Nation has already had experience with severe storm events, which are projected to increase with climate change (US EPA, 2016). The reservation faced widespread destruction from Hurricane Sandy in 2012. The storm eroded dunes and caused flooding of burial grounds, homes, and government buildings with wide-spread power outages. The Tribe received financial support from the United South and Eastern Tribes (USET) organization, as well as federal reconstruction money to rebuild, with the future impacts of climate change in mind (Shinnecock Environmental Department & Natural Resource Committee, 2013).

#### *Projected Impacts of Climate Change*

Because of their proximity, the Shinnecock Nation faces similar climate change impacts as the Saint Regis Mohawk. The Shinnecock Tribe is projected to experience rising annual temperatures of up to three (3) degrees Fahrenheit by the end of the century. Other changes include increases in average annual precipitation, earlier springs, decreasing winter snow cover, and shifting animal habitats (NYS Department of Environmental Conservation, 2014; NYS Energy Research and Development Authority, 2011). Unlike the Saint Regis Mohawk Tribe, the Shinnecock Nation expects severe coastal risks. Significantly, there will be an estimated 2.1 to 4.4 foot sea level rise along the reservation's shoreline by the end of the century (Shinnecock Environmental Department & Natural Resource Committee, 2013).

#### *Addressing Climate Change*

The Shinnecock Environmental Department and Natural Resource Committee decided to investigate the impacts of climate change because of concerns from Tribal members that climate change will harm shellfish cultivation (Shinnecock Environmental Department & Natural

Resource Committee, 2013). For updated information on climate change projections, the Shinnecock Tribe consults the northeast regional Climate Change Science Center in Massachusetts, established by the federal government. The Tribe also works with the Coastal Resilience Long Island project for climate data and integration of data into decision-making processes (Shinnecock Environmental Department & Natural Resource Committee, 2013). The Tribe has begun using federal money to install nature-based adaptation solutions to prepare for climate change impacts, including sea level rise. Nature-based solutions include planting sea and beach grasses to reduce erosion and installing boulders and oyster shell reefs to calm incoming waves (Sengupta & Lawal, 2020).

## Chapter 5: Content Analysis

This chapter discusses the analysis of the climate change adaptation plans (CAPs) for Albany, Brooklyn-Queens, Akwesasne, and the Shinnecock Nation. The analysis provides insight into what each of the respective governments deems important for climate change adaptation. Three common elements were chosen as codes for the content analysis. I identified the elements, regarded here as key terms, through the literature review and the four climate adaptation plans. I used these three key terms as codes in my analysis: “systems,” “resources,” and “vulnerabilities.”

Overall, the selected plans include these three terms as pivotal elements to their plans. All of the plans identify 1) what systems and sectors will be impacted by climate change, 2) who or what is perceived as the most vulnerable (i.e. buildings, people, ecosystems) to climate change, and 3) what resources need to be protected or engaged to mitigate risks. I selected these intentionally general terms, rather than more precise phrases, because the words themselves do not have much connotation beyond their simple definitions, thus offering a relatively neutral starting point for

comparison. There is greater meaning in the text surrounding the terms. The context informs the analysis and takeaway findings, because the four climate adaptation plans use each of the terms uniquely within their content, organize their use differently, and shape their use of the terms based on their differing priorities. Analyzing the language around these broad terms allows for a more open-ended interpretation of what is revealed by their usage, rather stopping at simple quantification of their mentions in the texts.

### Systems

Climate change is often described as a disruptive force, interrupting the systems that our global societies depend on every day (Pörtner et al., 2022). When reading through the four CAPs, I was struck by how each plan, while seeking a common purpose of adapting to climate change, understood their at-risk systems differently. The identified systems are essentially laid out through the chapter and section titles of the Albany and Akwesasne plans. The Albany plan focuses on social systems, infrastructural systems, and natural resources systems. The Akwesasne plan includes various environmental systems, such as river, winds, and forests. Reading the Brooklyn-Queens plan reveals that it heavily focuses on utility infrastructural systems such as energy, transportation, and sewer. The Albany plan was the only plan to define the word “system” as part of its key terms and definitions section. This thesis uses “system” as defined in the Albany plan’s definition, as follows:

System: A system is a combination of related parts organized into a complex whole.

Urban environments are comprised of interconnected social, infrastructure, and natural

systems that provide essential functions and services. (Mayor's Office of Energy & Sustainability, 2013: 13)

### Resources

The greater access a community has to resources, the better they can prepare for and respond to disasters (Brooks et al., 2005). This thesis sees resource as generally “a source of supply or support” (Merriam-Webster, 2023b). Resources are integral to the formation of CAPs; the resources may need to be protected or employed for future adaptation efforts (Brooks et al., 2005; Damon, 2018) and the language around what are and are not considered resources varies according to each author. For example, some may consider elements of the natural environment (i.e. water, trees, soil) to be “resources,” while others may see these as beings in relation with humans. Krakoff (2007) describes Traditional Ecological Knowledge as a system of relationships and natural dependencies that rarely delineates man from nature in a dichotomous way. Within that paradigm, elements of the natural environment may not necessarily be described as “resources”.

### Vulnerabilities

In this thesis, vulnerability is referred to as how the Intergovernmental Panel on Climate Change (IPCC) (2014: 5) defines it: “The propensity or predisposition to be adversely affected.”

Vulnerability is can be measured by the strength of the systems experiencing the hazard (Berkes, 2007). Vulnerability, while often the focus of climate change research (Berkes, 2007; Brooks et al., 2005; IPCC, 2014; Pörtner et al., 2022), may be contested. For example, some authors in the literature review emphasized the potential problems in labelling Indigenous peoples as

vulnerable to climate change (Brown & Westaway, 2011; Nicholas J. Reo et al., 2017; Norton-Smith et al., 2016; Whyte, 2013). I noticed when reading the plans that non-Tribal ones describe vulnerabilities upfront, while the Tribal plans rarely call out vulnerabilities explicitly. Regardless, all four plans discuss aspects of their communities that climate change may adversely affect. The Albany, Akwesasne, and Shinnecock plans include definitions for vulnerability and the Akwesasne and the Shinnecock Nation plans use the same definition:

Albany:

Vulnerability: The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity. (Mayor's Office of Energy & Sustainability, 2013: 13)

Akwesasne and the Shinnecock Nation:

Vulnerability: the susceptibility of a system to harm from climate change impacts. It's a function of how sensitive the system is to climate and the adaptive capacity of the system to respond to such changes. Generally, systems that are sensitive to climate and less able to adapt to changes are considered to be vulnerable to climate change impacts. (Saint Regis Mohawk Tribe's Environmental Division, 2013; Shinnecock Environmental Department & Natural Resource Committee, 2013)

I conducted manifest and latent content analyses using the three key terms as search terms. Both the counts of the terms and how the terms are employed is telling of what each of the four governments consider important for discussion and prioritization in the planning processes. I

established guidelines for the analyses that were used across all four plans. The word counts only included words used within the bodies of the plan. Term words used outside the body were not recorded, for instance in glossary definitions, quotes, titles, captions, tables, figures, and citations of the plans were not included, to reduce repetition of what is discussed in the body of the text. Additionally, not all the plans offer a breadth of figures, tables, or definitions so it may skew the tabulation for plans that include more of these items. For each term searched, variations were also included in the counts. For example, “vulnerabilities” can also be “vulnerable” and “vulnerability.” The page count does not include cover pages, the table of contents, works cited, nor the appendix sections. I used considerable judgment to categorize the context of each appearance of a key term. There are limitations to this approach, namely that the categorization chosen is somewhat subjective. For example, mention of medicine herbs as resources in the Akwesasne plan could also be considered agricultural, cultural, or even financial resources depending on the circumstance. Lastly, I ensured that each mention of a key term was not counted more than once, and it was categorized in only one way. This was to achieve the category that most aligned with the word’s context and achieve an accurate count of the various contexts.

While these three terms were selected for analysis due to their usage, there are other words that are noteworthy for their absence. For example, when I searched for variations of the word “responsible” (i.e., responsibility, responsibilities), the words appeared eleven times in the Akwesasne plan, twice in the Shinnecock Nation plan, once in the Brooklyn-Queens plan, and were entirely absent from the Albany plan. The word “culture” was found fifteen times in the Akwesasne plan, once in the Shinnecock plan, once in the Brooklyn-Queens plan, and was not

found in the Albany plan. Such observations are informative in answering the overarching research questions and will be discussed in Chapter 6, Discussion.

## 5.1 Manifest Content Analysis

Table 1. Count of Key Terms for Each Plan

Key Term	Akwasasne	Albany	Shinnecock	Brooklyn/Queens
System	25	53	8	70
Resource	49	15	6	3
Vulnerable	8	44	13	62
<b>Total Key Term Count</b>	82	112	27	135
<b>Total Words in Plan</b>	20,361	24,799	7,300	22,384

To capture the extent to which the terms were used by each plan, I first counted all occurrences of each term through a manifest content analysis. The total word counts for each key term and plan are shown in **Error! Reference source not found.** The column under each government is for the number of times the word, or a variation (i.e. vulnerable, vulnerability, or vulnerabilities), was used in the plan. The documents are different word lengths, as shown in the bottom row.

The results of the manifest content analysis are discussed below, in pairs. The results are outlined in pairs because of the geographic proximity and shared environmental features of the comparable governments, as explained in the Methodology.

### 5.1.1 Akwasasne and Albany Climate Change Adaptation Plans

The Albany Vulnerability Assessment and Adaptation Plan is approximately 4,438 words longer than the Climate Change Adaptation Plan for Akwasasne. In the manifest content analysis of the two plans, the Albany plan includes a higher occurrence of all the words with a total count of 112, while the Akwasasne Plan has a total of 82 occurrences of the words (**Error! Reference source not found.**). Akwasasne used “resource” 49 times and “system” 25 times throughout the

plan. The least used term in the Akwesasne plan was “vulnerable” with a count of eight (8), signifying that the plan used the term “resource” six (6) times more often than “vulnerable” (Figure 1).

In the Albany plan, the term with the highest count was “system” at 53 occurrences, which is three (3) times more than its use of the term “resource” at 15 counts (Figure 2). The second highest counted word was “vulnerable,” mentioned 44 times. This means that the Brooklyn-Queens plan used “system” over 23 times more than “resource.”

#### 5.1.2 Shinnecock and Brooklyn-Queens Climate Change Adaptation Plans

Of the four plans, the Shinnecock CAP was the most evenly balanced in its use of the key terms. This was also the shortest of the CAPs, at only 7,300 words (Table 1). Of the words found in the Shinnecock plan, “vulnerable” was used most (Figure 3). However, the difference is small; the word “vulnerable” appeared thirteen times, followed closely by “system” with eight (8) counts, and “resource” which appeared six (6) times.

Like the Albany plan, the word “system” appears most often in the Brooklyn-Queens plan with 70 occurrences (Figure 4), followed by “vulnerable” with 62 occurrences. Both the Brooklyn-Queens plan and the Shinnecock Nation plan used “resource” the least of all three terms. Resource was counted a mere three (3) times for the Brooklyn-Queens plan which is half as often as in the Shinnecock plan, even though the Shinnecock plan was substantially shorter in length.



## 5.2 Latent Content Analysis

The observations made in the manifest content analysis set the foundation for the latent content analysis. The latent content analysis situates the words within the text to further examine their qualitative use and what meaning they conveyed in the larger context.

For the latent content analysis, I identified, categorized, and tallied up the specific ways that the three key terms were used. My process began by searching for the terms and their variations in the text of each CAP. I then read the surrounding paragraph for each appearance. From this, I developed categories, unique to each term, capturing the context and organizing the variety of meanings assigned to the uses. I discuss the findings further, including poignant approaches and themes, in the subsequent chapter.

### 5.2.1 Systems

I totaled each use of the word system in Table 2 to organize the various ways it appeared in the texts. I formed categories shown in the leftmost column of Table 2 according to similar usages. I did not include the use of system as part of Geographic Information Systems, because that is a specific technical tool for mapping areas and does not inform how the creators of these plans view the larger systems affected by climate change.

*Table 2. How the term “system” appeared in each climate adaptation plan*

	<b>Akwesasne</b>	<b>Albany</b>	<b>Shinnecock</b>	<b>Brooklyn/Queens</b>
<b>System</b>				
General		14		6
Environmental	11	15	6	2
Water, Sewer and Waste	5	14	1	13
Transportation		5		14
Energy		3		25
Emergency Services	1	2		6

Cultural	2			
Communication				4
Agricultural	6		1	
<b>Totals</b>	<b>25</b>	<b>53</b>	<b>8</b>	<b>70</b>

*Akwesasne and Albany Climate Change Adaptation Plans*

The Akwesasne plan was found to focus mostly on environmental systems and discussed agricultural systems more than all the other plans combined. It was the only plan that explicitly mentioned cultural systems. The only other plan that used system within an agricultural context was the Shinnecock CAP.

The manifest content analysis showed that the Albany CAP used “system” more frequently than the other terms. Like the Akwesasne CAP, the Albany CAP discussed systems mostly within the context of environmental systems (Table 2). The second most common usage was related to water, sewer, and waste systems. The Albany plan was the only one to define system in its definitions section. The plan includes social systems in its definition of system (*italics added*):

A system is a combination of related parts organized into a complex whole. Urban environments are comprised of interconnected *social*, infrastructure, and natural systems that provide essential functions and services. (Mayor’s Office of Energy & Sustainability, 2013: 13)

By including social systems in this definition, the Albany plan expresses that systems extend beyond the physical environment. While the other plans integrate social systems into various chapters, the Albany plan goes as far as to introduce social systems as its own chapter and includes the topics of economic vulnerability, social vulnerability, and public health within it. As the topics indicate, the social system chapter mostly describes the vulnerabilities of certain

populations, specifically “children and the elderly; asthmatics and individuals with pre-existing illnesses; low-income groups; small business owners; and outdoor workers and athletes...those who do not speak English or those who are more socially isolated...” (Mayor’s Office of Energy & Sustainability, 2013: 37).

In addition to the social system chapter, the Albany plan has a chapter focused on natural resources systems. The chapter evaluates different environmental features like waterways, urban forests, and natural habitats. Like the social system chapter, the natural resources system chapter highlights the vulnerabilities of the natural environment due to current human impacts and projected climate change impacts. Regardless of their structures, the Albany and Akwesasne plans cover similar environmental systems, such as waterways and forests.

#### *Shinnecock and Brooklyn-Queens Climate Change Adaptation Plans*

The Shinnecock CAP was the only plan to explicitly mention food systems. Prioritizing food systems is mentioned under key action recommendations in the Executive Summary:

Encourage food security and food sovereignty through reestablishment of traditional food systems and community farming. (Shinnecock Environmental Department & Natural Resource Committee, 2013: 22)

The Shinnecock plan, like the Akwesasne plan, focused almost entirely on environmental systems, including specific types of ecosystems such as “marsh systems” (Shinnecock Environmental Department & Natural Resource Committee, 2013: 14). The Brooklyn-Queens plan largely examined human-made infrastructural systems that are part of the built environment, like the energy grid, transportation, and water, sewer, and waste systems.

### 5.2.2 Resources

The Akwesasne, Albany, and Shinnecock plans identify resources most frequently in a general sense. The general use is as a broad concept, not referencing a specific type of resource (Table 3). The Akwesasne, Albany, and Shinnecock CAPs included at least one (1) resource that was unique to that plan. For example, the Shinnecock CAP specifically mentions marine and hydrological resources are at-risk to climate change impacts. These are categorized as water resources, as shown in the leftmost column of Table 3. The Akwesasne plan includes an entire chapter on medicine herbs, evaluates their conditions, and identifies adaptation actions for this resource. Mention of medicine herbs as resources in this plan are categorized under agricultural resources in the leftmost column.

*Table 3. How the term “resource” appeared in each climate adaptation plan*

	<b>Akwesasne</b>	<b>Albany</b>	<b>Shinnecock</b>	<b>Brooklyn/Queens</b>
<b>Resource</b>				
General	14	9	2	
Water	8	1	1	
Forestry	10			
Agricultural	13		1	
Wetland	3			
Fuel		1		
Financial	1	4	1	3
Cultural			1	
<b>Totals</b>	<b>49</b>	<b>15</b>	<b>6</b>	<b>3</b>

#### *Akwesasne and Albany Climate Change Adaptation Plans*

The Akwesasne CAP used the term resource in a variety of ways. The term was mostly used in a general sense. Resource was used the second most regarding forestry resources, followed closely by agricultural resources. The Albany CAP mentioned resources within a financial context more than the other plans. The Albany plan also singularly referred to fuel resources.

*Shinnecock and Brooklyn-Queens Climate Change Adaptation Plans*

The Shinnecock CAP, the shortest of the plans in length, mentioned water, agricultural, financial, and cultural resources once (1) each. The Brooklyn-Queens plan only mentioned resources three (3) times, all in the context of finances.

5.2.3 Vulnerable

Two of the plans, the Albany and Shinnecock CAPs, used vulnerable mostly in a general sense, referring to the concept rather than assigning context. How vulnerabilities are considered in the four CAPs appears to touch on the greater intentions behind the creation of each plan. I found that while the Akwesasne plan discussed natural environment vulnerability the most, the Albany CAP discussed social vulnerabilities more than the other plans. The Brooklyn-Queens plan followed in discussing social vulnerabilities the second most of all the plans but focused mostly on vulnerability in the build environment. Built Environment is used here to refer to buildings, roads, industrial areas, and various types of physical infrastructure. The limited or nonexistent discussion of social vulnerabilities in the Tribal plans may indicate that the ways that the Tribes view vulnerability differs from how the non-Tribal plans do.

*Table 4. How the term “vulnerable” appeared in each climate adaptation plan*

	<b>Akwesasne</b>	<b>Albany</b>	<b>Shinnecock</b>	<b>Brooklyn/Queens</b>
<b>Vulnerable</b>				
General	1	20	6	9
Natural Environment	5	4	3	4
Social	1	10		5
Agriculture	1			
Health		3		8
Built Environment		3	4	31
Economy		4		5
<b>Totals:</b>	<b>8</b>	<b>44</b>	<b>13</b>	<b>62</b>

### *Akwesasne and Albany Climate Change Adaptation Plans*

The Akwesasne plan explicitly discusses vulnerability very little, especially compared to how often the plan mentions resources. The Akwesasne CAP discusses vulnerability most often within discussion on the natural environment, which is consistent with the high usage of the word resource and the overall structure of the plan. On the other hand, the Albany plan is centered around identifying and understanding vulnerability for various systems and sectors. The plan uses vulnerable in a mostly general sense, followed up by social vulnerability as the second most frequent context. The Albany CAP mentioned vulnerability within the context of the built environment (buildings, roads, industrial areas, utility infrastructure) about as often as within discussions on the natural environment, health, and economy.

### *Shinnecock and Brooklyn-Queens Climate Change Adaptation Plans*

The Shinnecock CAP uses vulnerable frequently in a general sense, followed by built environment. The only other use of vulnerable is in the context of the natural environment. The Brooklyn-Queens CAP applied vulnerable mostly to the built environment with very little mention of vulnerability of the natural environment or social vulnerabilities. Like the Albany CAP, the Brooklyn-Queens plan included economic vulnerability, which the Tribal plans did not.

## Chapter 6: Discussion of Findings

### 6.1 Introduction

In the content analysis, I described the key terms I selected as well as how I divided those terms into categories for the latent content analysis. Because systems, resources, and vulnerabilities are consistently discussed across the climate adaptation plans, these key terms offered an even,

neutral ground for observations on how they are employed by the four plans. Patterns emerged from my analysis that warrant further discussion. For example, the Akwesasne, Albany, and Shinnecock plans all discussed the term “system” most often regarding environmental systems. The Akwesasne plan discussed “resource”, specifically environmental resources, far more than the other plans and the Brooklyn-Queens plan mentioned it incredibly few times. Both Tribal plans mention “vulnerable” few times and within a social context only once, if at all. With these patterns, the analysis of the plans showed that the key terms were useful tools for uncovering how the texts framed their respective priorities and approaches to adaptation planning.

This discussion of findings seeks to ground the results that emerged from the content analysis in the narratives and language of the plans, while tethering these findings to the scholarship covered in the literature review. The discussion of findings is divided into two components. The first elaborates on the two approaches to adaptation planning observed across all four plans: relational and technocratic approaches. The second component discusses the noteworthy themes revealed from analyzing the Tribal plans. These findings address the assumptions pulled from the literature that the Tribal plans are likely to adopt a “relational” approach to climate change, which may emphasize adaptation strategies that are derived from and function to support practices grounded in their respective cultures. By comparison, the literature had suggested that non-Tribal climate adaptation plans will prioritize recommendations for hard infrastructure and preservation of the built environment. These central approaches and themes outlined in the discussion of findings answer my research questions by identifying 1) Tribal priorities in adaptation planning and how these priorities are communicated through their plans and 2) how Tribal climate adaptation plans differ from non-Tribal climate adaptation plans.

## 6.2 Approaches to Adaptation Planning

### 6.2.1 Relational Approach

The literature on Indigenous climate change adaptation calls attention to relationships as foundational to both Tribal adaptation efforts and cultures. The literature identifies Indigenous: 1) relationships with place; 2) social networks; and 3) relations with networks of non-humans as significant. There is some overlap across these three forms of relational adaptation planning, but they also have distinct qualities worth noting. While analyzing the contents of the Tribal and non-Tribal plans for their uses of the terms system, resource, and vulnerable, I observed if and how the plans included relational considerations.

#### *Relationship to Place*

Place attachment has become an increasingly critical topic for understanding social implications of climate change (Agyeman et al., 2009; Burley et al., 2007; Cutter et al., 2008; Devine-Wright, 2013). Agyeman et al. (2009) explain that the impacts of climate change extend beyond the physical aspects, including “important *psychological, symbolic, and particularly emotional* aspects of healthy human habitats described by environmental psychologists as ‘place attachment’” (509).

Scholarship asserts that American Indian cultures and spiritual practices are shaped by ongoing relationships with their respective places (Hibbard et al., 2008; Krakoff, 2007; Morishima, 2018). The two Tribal CAPs describe their relationships with their distinct places, their place attachments, through the natural environments of their areas. The Akwesasne CAP is organized according to aspects of the Tribe’s natural environment and cultural beliefs, in the format of the traditional Mohawk Thanksgiving Address. This organization links a “relationship to place” into



each chapter of the document. For example, within the Small Plants and Grasses chapter, the following observations are included:

In the summer of 2012, farmers didn't get their second cut of hay for the winter season.  
Residents who planted gardens worked extra hard to keep gardens from drying up.  
Sweetgrass used for smudging and to make baskets wasn't tall and had a short season.  
(Saint Regis Mohawk Tribe's Environmental Division, 2013:19)

These observations are presented through interactions between the Tribal members and the land. Because the Tribe has an ongoing relationship with their place, which includes hay and sweetgrass, it is no wonder that Tribal members are able to notice the abnormalities that indicate how the climate is impacting the land (Saint Regis Mohawk Tribe's Environmental Division, 2013).

The Shinnecock CAP exhibits a distinct sense of place as well. The plan includes a list of changes observed by Shinnecock Nation members across their land, such as "storm surge ate away a significant amount of bluffs at the West Woods tribal reservation" (Shinnecock Environmental Department & Natural Resource Committee, 2013:11) and winter is "not as cold as in recent past history" (Shinnecock Environmental Department & Natural Resource Committee, 2013:12). The inclusion of community voices in the Akwesasne and Shinnecock CAPs reflects the assertion by Nakashima et al. (2012) that Indigenous understandings, partly based on observed information accumulated over time, is formed by community members. Put otherwise, adaptation strategies based on traditional knowledge are grounded within the community.

While the content analysis revealed that the Albany CAP discussed environmental systems frequently, the document does not use first-hand observations of the natural environment. Instead, the document uses a removed, scientific tone to describe threats to the land. For example:

The Pine Bush Preserve provides habitat for over 90 species of birds, and was designated a Bird Conservation Area... Pine Bush Preserve is vulnerable to direct and indirect climate change impacts, as well as existing threats unrelated to climate... the Pine Bush Preserve met five out of nine criteria that ClimAID used to determine the vulnerability of species, communities, and ecosystems to climate change. (Mayor's Office of Energy & Sustainability, 2013: 64)

The above quantifies the significance of the Preserve ("90 species of birds" and "met five out of nine criteria") without any personal or cultural connections. The Albany CAP describes place without elevating any relationship to what is being discussed. This treats the place, in this case the Pine Bush Preserve, as if it is in a vacuum, distant and separated from the human realm.

### *Social Networks*

Social networks have emerged as an important asset for strengthening adaptive capacity in the literature (Adger, 2003; Moser et al., 2008; Pelling & High, 2005) and climate adaptation plans. Through social networks, communities can share resources and support in response to extreme storm events, such as those projected with climate change (Damon, 2018; Solnit, 2010).

As mentioned above, the Akwesasne and Shinnecock CAPs include observations made by Tribal members. While this shows how the plans emphasize relationship to place, it also exhibits the social networks involved in drafting the plans. In developing their CAP, the Shinnecock Nation

held a community workshop on climate change adaptation (Shinnecock Environmental Department & Natural Resource Committee, 2013:5). The Tribal community expressed interest in “solutions to the shellfish and sandbar changes, as well as the possibility of bacterial contaminations to shellfish” and “flooded basements issue...to prevent homes and the Nation’s burial ground from flooding” (Shinnecock Environmental Department & Natural Resource Committee, 2013:5). By gathering community concerns and bringing the concerns directly into the CAP as guiding issues, the Shinnecock Nation prioritized social networks in their approach to adaptation.

The Akwesasne CAP includes a chapter titled “People” with adaptation recommendations specifically for their society, a small fraction of the entire plan. One of the recommended adaptation actions within this chapter is to provide meals, transportation, and other services to seniors through the Seniors Center, and use the center as a heating/cooling station in extreme weather. The Seniors Center is an organization through which social networks, information, and coordinated actions can flow for social benefits and well-being. In other words, this recommendation leverages social networks as a tool for adaptation.

The content analysis showed that the Albany CAP explicitly mentioned vulnerabilities more than the other plans. Of the vulnerabilities mentioned, the Albany plan discussed social vulnerabilities most frequently. The plan describes social connection and networks as adaptive tools to “rapidly and effectively rebound from extreme weather events” (Mayor’s Office of Energy & Sustainability, 2013:37). The plan includes recommendations that would support social networks, including a recommendation to “build and support neighborhood networks” (Mayor’s Office of Energy & Sustainability, 2013:82).

### *System of Relationships*

As discussed in the literature review, Traditional Ecological Knowledge (TEK) can be used by Indigenous communities as a resource for climate change adaptation (Chief et al., 2014; Hepler & Kronk Warner, 2019; Hosen et al., 2020; Nakashima et al., 2012; Norton-Smith et al., 2016; Turner & Spalding, 2013; Williams & Hardison, 2013). Scholarship on TEK describes humans as innately intertwined with other beings in a system of interdependency and connection (Krakoff, 2007). Whyte (2013) describes this interdependency as a system of relationships that includes networks of responsibilities between all living beings. For example, in addition to their climate adaptation plan, the Saint Regis Mohawk Tribe is working to protect black ash stands from the impacts of climate change. The Tribe has a traditional relationship with the black ash, as the Tribe depends on the tree's bark for their basket weaving practices. The relationship between the Tribe and the black ash includes Tribal responsibility for supporting the tree's survival. (Climate Change Response Framework, 2017)

The literature's emphasis on Indigenous systems of relationships and responsibilities is consistent with the Tribal CAPs. Relational networks of responsibility towards other beings appear in both the Akwesasne and Shinnecock plans. The overall structure of the Akwesasne plan acknowledges the various non-human entities the Tribe is in relation with. The Akwesasne plan prioritizes features of the local ecology and the other beings it encompasses. Variations of the word "responsible" appear 11 times in the Akwesasne plan (Saint Regis Mohawk Tribe's Environmental Division, 2013). The significance of responsibility, as used in the plan, is defined in the Creator chapter (*italics added*):

The concept of *responsibility* is central to the beliefs of the Haudenosaunee. The Creator assigned to all of the creatures of Creation the *responsibilities* to protect and keep the universe. We keep faith with the instructions of the Creator by fulfilling our *responsibilities* to the Earth, Creation, and all things named. (Saint Regis Mohawk Tribe's Environmental Division, 2013:51)

In the Shinnecock plan, responsibility is considered within a similar context as the Akwesasne plan, inclusive of responsibility for the natural environment (emphasis added):

...we have been gifted by the Creator with specific values and *responsibilities* as Shinnecock people... (Shinnecock Environmental Department & Natural Resource Committee, 2013:Letter of Commitment from the Shinnecock Indian Nation)

Neither of the non-Tribal CAPs give meaningful attention explicitly to networks of responsibility with other living beings. . Although the Albany plan does not discuss responsibilities explicitly, the attention given to environmental systems may indicate an unspoken sense of responsibility for other living beings within the city (Mayor's Office of Energy & Sustainability, 2013). This argument cannot be made for the Brooklyn-Queens plan, however; the plan rarely discussed the natural environment (NYC Special Initiative for Rebuilding and Resiliency, 2013).

#### 6.2.2 Technocratic Approach

I had hypothesized that the non-Tribal climate adaptation plans would be more utility driven and focused on technocratic solutions to climate change. Technocratic refers to governance by technical experts (Merriam-Webster, 2023a). Regarding climate change adaptation, a technocratic approach amplifies the input of engineers, urban planners, economists, or other specialized experts over the input of community members who are most affected by adaptation

measures (Anguelovski et al., 2016). Technocratic framing in climate change adaptation can come across as absolute, objective truth, thus avoiding contestation and excluding non-experts who have experiential knowledge (Ojha et al., 2016).

The Brooklyn-Queens plan exemplifies a technocratic approach to climate adaptation planning. The plan focuses almost solely on aspects of the engineered environment, such as hard infrastructure systems and the vulnerabilities of buildings (NYC Special Initiative for Rebuilding and Resiliency, 2013). Systems appeared in the Brooklyn-Queens plan largely in the context of energy and transportation systems. The plan made very little mention of environmental systems and had no discussion on cultural systems. Resource was only mentioned three (3) times in the entire Brooklyn-Queens CAP, and all three (3) times it referred to financial resources (NYC Special Initiative for Rebuilding and Resiliency, 2013). The Brooklyn-Queens plan does not discuss threats to the natural environment, does not mention the word “ecology,” nor does it include first-hand community observations of climate change impacts. Instead, the plan begins by establishing a sense of place focused within the built environment. In this opening paragraph to the plan, industrial means of production, economic boom, and transactional spaces are highlighted (*italics added*):

The manager of a family-owned *scrap-metal salvage company* along the Queens side of Newtown Creek watches as backhoes lift mounds of shredded metal and deposit them into barges. Over in Williamsburg, a young couple hops off of the East River Ferry, walks past gleaming *new high-rises* along the waterfront and heads over to Bedford Avenue to meet friends at a *coffee house*... This is the Brooklyn-Queens waterfront, where old and new, past and present, historic *industry* and a burgeoning creative

*economy*, all converge in a bracing, up-to-the-minute mix. (NYC Special Initiative for Rebuilding and Resiliency, 2013:239)

Vulnerability was mentioned sixty-two times in the Brooklyn-Queens plan (NYC Special Initiative for Rebuilding and Resiliency, 2013). Most mentions of the term vulnerable were within the context of the built environment. Social vulnerability was mentioned five (5) times and vulnerabilities in the natural environment four (4) times. When discussing vulnerability, the Brooklyn-Queens plan heavily focused on the potential material loss:

The area is also vulnerable to weather-related events. This is because much of the neighborhood rests on low-lying former marshland, leaving it flood-prone. As demonstrated during Sandy, such flooding can damage the mechanical systems of the buildings, the possessions of those living in ground-floor residential units, the inventory of ground-floor retailers, and the heavy equipment and products of industrial businesses. (NYC Special Initiative for Rebuilding and Resiliency, 2013:242)

This above paragraph centers the potential harm to non-living features of the human-made built environment. The focus is on the possessions of people living on the ground floor residential units, rather than on the people themselves. The vulnerable objects mentioned in the last two sentences, retail inventory and industrial products, are removed from any significance beyond economic means. There is no relational connection made as to what this material loss means to the communities of Brooklyn-Queens.

When the Brooklyn-Queens plan surfaces community concerns, it immediately addresses the concerns with a technocratic response. The plan highlights industrial businesses as vulnerable

and defining features of the area, while simultaneously evaluating and dismissing the concerns the community has about the legacy of industry:

In Gowanus, the impacts from Sandy came mainly from Gowanus Bay, which, as it filled with Sandy's surge, elevated water levels in the Gowanus Canal... Although a significant community concern in the wake of the storm was whether the floodwaters from this Superfund site had contaminated the area, EPA testing showed that the toxic sediment at the bottom of the Canal remained largely undisturbed, and that bacteria levels in the floodwaters did not pose a significant health risk. (NYC Special Initiative for Rebuilding and Resiliency, 2013:246)

Because the technical experts, in this case the EPA, decided the concerns were unfounded, the plan moved on without allowing for contestation or community observations and experiences (NYC Special Initiative for Rebuilding and Resiliency, 2013).

While the Shinnecock plan mentions environmental systems and natural resources more often than the Brooklyn-Queens plan, it frequently evaluates the natural environment for human utility. For example, when discussing the impacts of climate change on forests, the plan says there are "reduced opportunities for cold season recreation due to decreased snowpack" (Shinnecock Environmental Department & Natural Resource Committee, 2013:19). Unlike the Brooklyn-Queens plan, the Shinnecock CAP is structured around the concerns expressed by community members. When the plan brings in technical expertise, it is informed by these concerns:

Shinnecock Nation invited a coastal engineer to visit Nation lands on January 8, 2013 to observe the erosion caused and areas flooded by Hurricane Sandy, as well as gain a



general understanding of the Nation's concerns related to climate change and sea level rise. (Shinnecock Environmental Department & Natural Resource Committee, 2013:13)

Similar to the Shinnecock plan, the Akwesasne CAP centers the natural environment and community concerns. The Akwesasne plan is driven primarily by social, cultural, and ecological considerations, with recommendations focused mostly on education, outreach, planning, monitoring, and conserving and restoring habitat (Saint Regis Mohawk Tribe's Environmental Division, 2013). The Albany CAP dedicates significant portions of the document to social vulnerabilities and vulnerabilities in the natural environment. As mentioned in discussion on the relational approach, the Albany plan did not incorporate input from community members, preferring a detached, scientific tone when examining climate change impacts. The Albany plan includes a variety of recommendations, half of which are focused on infrastructure and buildings and largely removed from community participation (Mayor's Office of Energy & Sustainability, 2013).

### 6.2.3. Conclusion

In summary, the Akwesasne and Brooklyn-Queens climate adaptation plans largely met the assumptions I derived from the literature. The Akwesasne plan takes a primarily relational approach to adaptation planning, while the Brooklyn-Queens plan is almost entirely, steadfastly technocratic in its approach. The Albany and Shinnecock plans, however, do not fall within the dichotomous approaches. At first glance, the Albany plan appears to have a technocratic approach to adaptation planning because its explanations of climate change impacts are heavily informed by scientific, technical information. The recommendations that the Albany plan puts forward, however, support community action in adaptation strategies. Almost reversing the Albany plan, the Shinnecock Nation plan is driven by community input. To address the concerns

of community members, the authors sought technical expertise that informed their adaptation recommendations. The Shinnecock plan shows that Tribal adaptation plans do not automatically fit into a relational approach, which counters what is implied by the literature on the topic. Similarly, the Albany plan does not inherently fall within a technocratic approach simply because it is a non-Tribal plan; rather, the two plans blend the approaches. It also indicates that the two approaches may be used in combination to varying extents and are not inherently opposed.

### 6.3 Themes in Tribal Planning

#### 6.3.1 Ecological Adaptation

Norton-Smith et al. (2016) and Nicholas J. Reo et al. (2017) describe how Indigenous vulnerability narratives can erase the ways that Indigenous groups historically and presently respond to and navigate environmental change with agency. While the literature frequently views American Indian Tribes as particularly vulnerable to climate change (Galloway McLean et al., 2009; Hepler & Kronk Warner, 2019; Jantarasami et al., 2018; Krakoff, 2007; Warner, 2015; K. Whyte, 2013), the CAPs of these two Tribes discuss vulnerability very little and barely touch on social vulnerability. This indicates that vulnerability may look different to the Tribes than it does to the non-Tribal Albany plan, which discusses social vulnerability the most. (Saint Regis Mohawk Tribe's Environmental Division, 2013; Shinnecock Environmental Department & Natural Resource Committee, 2013)

The Akwesasne CAP discusses environmental resources, such as forestry, water, and wetlands more than any of the other plans. When discussing systems, the Akwesasne plan most frequently references environmental systems. When the Akwesasne plan discusses vulnerability, it is within

the context of the natural environment. Instead of using an anthropocentric lens for vulnerability focused on human social systems and the built environment, the Akwesasne plan highlights the experiences of non-human entities and their vulnerabilities. (Saint Regis Mohawk Tribe's Environmental Division, 2013)

This attention to the natural environment prioritizes understanding how local ecology is impacted by climate change and the adaptation possibilities for the ecological landscape. Both Tribes express that while they are looking into ways of adapting to climate change, there is flexibility to this new ecological future. This is unlike the non-Tribal plans, which do not treat the changing local ecology with the same flexibility (Mayor's Office of Energy & Sustainability, 2013; NYC Special Initiative for Rebuilding and Resiliency, 2013). The Akwesasne plan expresses optimism in its detailing of the potentially beneficial opportunities that may come with climate change (*italics added*):

At the same time, climate change does have the potential to create *beneficial opportunities*. For example, increased air temperatures have the potential to lengthen the growing seasons of medicinal plants, higher carbon dioxide concentrations in the air can enhance plant growth, and in some areas, the availability of water resources may increase as rainfall patterns shift as a result of climate change. (Saint Regis Mohawk Tribe's Environmental Division, 2013:2)

The Shinnecock CAP expresses flexibility on the incoming environment that climate change is bringing in the conclusion paragraph of the plan (*italics added*):

As the world heats up, sea level rises. The shoreline erodes. Salt water intrudes inland into freshwater areas. Some species will disappear. Others will appear. We must act now

to make sure that *this new ecosystem* is thriving and productive. (Shinnecock Environmental Department & Natural Resource Committee, 2013:24)

The above paragraphs convey a sense of autonomy inherent to the natural environment, that non-human beings are going to change and we, as humans, may evolve in how we interact with this changing world. The caring decision to meet another being where they are, as they shift into new ways of existing, is the stuff of an ongoing, persevering connection – a relationship. This interrelated, interdependent way of looking at the world leaves room for evolution in “the intimacy of human relations with plants, animals and entities” (Whyte, 2017:2). Relationships with the incoming environment connects to the relational approach observed in the CAPs.

While the Albany CAP also gives attention to how the natural environment will be impacted by climate change, it does not indicate inherent autonomy within the changing landscape or mention possibly positive outcomes. Instead, the plan offers a specific adaptation response that, through human intervention, removes and replaces the present ecology:

However, in the long run, as climate change becomes more dramatic, native species may no longer be suitable for Albany’s climate. The city may have to switch to more southern species for their tree planting. (Mayor’s Office of Energy & Sustainability, 2013:60)

### 6.3.2 Sovereignty

The literature emphasizes self-determination as a paramount issue for Tribal climate change adaptation, because of the threat climate change poses to Tribal existence (Ford & Giles, 2015; Hibbard et al., 2008; Krakoff, 2011). Impediments to self-determination may worsen as climate change poses a significant threat to Indigenous peoples’ ability to subsist and maintain traditional economies (Galloway McLean et al., 2009; Jantarasami et al., 2018). However, as Brown & Westaway (2011) assert, humans are never completely passive to environmental threats like

climate change. As Tribes strategize climate adaptation efforts, their power to make key decisions and exercise autonomy as sovereign nations is important for adapting with self-determination (Hui, 2020).

Self-determination is a significant theme throughout both Tribal CAPs. Both plans begin with histories of their respective nations and backgrounds on how their societies have changed. For example, the Shinnecock plan mentions that their Nation was not recognized as a sovereign government by the United States until 2010 (Shinnecock Environmental Department & Natural Resource Committee, 2013). The first page of the Shinnecock CAP features a Letter of Commitment from the Shinnecock Indian Nation in which the Tribe commits to preserving and promoting their “sovereignty and freedom of self-determination in order to advance the common good of the people and Nation” (Shinnecock Environmental Department & Natural Resource Committee, 2013:Letter of Commitment). The first chapter of the Shinnecock CAP includes a description of their history and culture with emphasis on how they have persistently lived on their ancestral homelands.

### 6.3.3 Cultural Continuity

Both plans prioritize cultural continuity as integral to their sovereignty and self-determination. Climate change is a significant threat to sacred and historically significant sites for Indigenous peoples, which impacts cultural traditions (Ford & Giles, 2015) and the Shinnecock plan includes observations on the “increased risk in loss of cultural and historical sites on coastline to sea level rise” (Shinnecock Environmental Department & Natural Resource Committee, 2013: 20).

Early in the Akwesasne plan, as part of the history of the Tribe, there is discussion on the significance of sovereignty and cultural preservation:

Mohawk people recognize that they belong to a very distinct society, and as unconquered people living in a nation within a nation will continue to exist and hold steadfast to their culture and traditions within today's modern society. (Saint Regis Mohawk Tribe's Environmental Division, 2013:6)

Indigenous communities may assert self-determination through climate adaptation planning by creating adaptation strategies rooted in local values and Indigenous ways of knowing (Daigle et al., 2019; Hosen et al., 2020; Nakashima et al., 2012). As noted by Pelling & High (2005), Indigenous communities may develop climate change solutions through embedded cultural values and social networks. The Akwesasne CAP is structured to follow the Tribe's Thanksgiving Address, an intentional format as climate change "threatens not only local plant and animal species but also Tribal sovereignty, economy, and culture" (Saint Regis Mohawk Tribe's Environmental Division, 2013:2).

The Akwesasne plan's use of the Thanksgiving Address also touches on how Indigenous cultural ties to the environment are intertwined with their economies, as Indigenous livelihoods are often dependent on natural resource availability and seasonal trends (Jantarasami et al., 2018). Thus, the environmental degradation posed by climate change threatens both Indigenous systems of culture and economy (Jantarasami et al., 2018). The Akwesasne plan describes the connection between economy and culture:

Many activities that are traditionally practiced by Tribal communities and which continue to be important culturally and economically to these communities, such as fishing, medicinal plant harvest, and care of natural ecosystem health, are tied directly to climate. (Saint Regis Mohawk Tribe's Environmental Division, 2013:2)

There is a consistent priority across both Tribal plans that lies at the intersection of sovereignty, culture, and traditional economy: food. The Akwesasne plan elaborated on the various food staples significant to the Tribe and how, through education and outreach, use of these staples can help Tribal members adapt to climate change:

In the future, the Saint Regis Mohawk Tribe could have Adaptation Planning classes on how to prepare for climate change by teaching a number of traditional skills such as hunting, fishing and harvesting techniques; how to cure and smoke fish; how to garden, weed, harvest, and can; make clothes/pouches out of hide; make baskets; prepare and dry corn, beans and squash and other root vegetables; identify, prepare, and harvest medicine plants; prepare Indian Corn for drying, braiding, grinding, and making into mush; prepare cornbread; make drums and rattles; carve wood; and use cow horns. These classes would help to pass down the traditional practices of the Tribe in the face of the changes that climate change will bring. (Saint Regis Mohawk Tribe's Environmental Division, 2013:52)

As noted above, traditional skills and practices involving food staples and their byproducts (i.e. fish, hides, vegetables, and medicine plants) are viewed as means of adaptation to climate change. Scholarship recognizes that traditional knowledge, such as traditional skills and practices, is a tool for supporting the socio-ecological resilience of Indigenous communities (Hosen et al., 2020; Turner & Spalding, 2013). The Saint Regis Mohawk Tribe has struggled to maintain their traditional food staples due to settler colonial harms. Pollution from nearby industrial facilities has affected regional fish populations, limiting where the Tribe is able to fish

in the area (NOAA, 2021). In the Tribe's CAP, loss of syrup, another traditional food staple, signals a changing climate:

At Akwesasne in the Spring of 2012, those who tap the Maple trees for syrup did not get any syrup at all due to the warm temperatures through the winter months that set in quickly in early spring. The nights were not getting cold enough to get the syrup to flow. People also observed that trees dried out early, and the color of leaves started changing early, in August 2012. (Saint Regis Mohawk Tribe's Environmental Division, 2013:31)

The Shinnecock and Akwesasne plans discuss resources within the context of agriculture. The Akwesasne plan also deliberated the vulnerability of their agriculture, while the Shinnecock plan recommended traditional food systems and community farming as a means of addressing climate change impacts. The Akwesasne plan includes chapters on protecting and adapting various foods significant to the Tribe, such as wild berry species:

The seeds of wild berry plants in Akwesasne could be collected as has been done with Black Ash seeds to ensure that the historic wild berries of the Tribe survive even if wild populations of these species disappear from the area due to climate change. (Saint Regis Mohawk Tribe's Environmental Division, 2013:22)

The Shinnecock Environmental Department and Natural Resource Committee began researching the impacts of climate change because of concerns that it would impact local shellfish, a traditional food staple for the Tribe (Shinnecock Environmental Department & Natural Resource Committee, 2013). This is reiterated in one of the seven action recommendations listed in the Shinnecock CAP, to "encourage food security and food sovereignty through reestablishment of



traditional food systems and community farming” (Shinnecock Environmental Department & Natural Resource Committee, 2013:Executive Summary). This approach demonstrates the Tribe’s understanding of the intersection of sovereignty and culture. Rather than mitigate food insecurity with grocery stores, the plan specifically prioritizes traditional food systems and community farming, which are culturally and socially informed approaches to food security.

The Albany and Brooklyn-Queens plans give little attention to cultural preservation. The authors of these plans appear to assume the audience is within the same cultural paradigm. The authors do not appear to have had their cultural continuity historically threatened, therefore they may not see the need to introduce their culture. The Tribal government plans, however, describe their cultural perspectives at the forefront, which may indicate 1) they perceive the audience to be within the predominant paradigm of settler colonialism and 2) see their own cultures as outside of that paradigm and feel compelled to distinguish their cultures.

Although Brooklyn-Queens is geographically proximate to the Shinnecock nation, the non-Tribal plan does not discuss the specific local or regional food sources, like shellfish. When addressing food issues, the plan is most concerned with climate change impacts to supply chain networks and distribution centers (NYC Special Initiative for Rebuilding and Resiliency, 2013). The other non-Tribal plan for the Albany primarily discusses agriculture in relation to its negative impacts on the quality of water bodies (Mayor’s Office of Energy & Sustainability, 2013). Like the Shinnecock plan, the Albany plan includes sustainable local food production as a recommendation, although not for the goal of food sovereignty.

## Chapter 7: Conclusion and Recommendations

### 7.1 Conclusion

The above literature review, background summary, content analysis, and discussion of findings have addressed what two northeastern Tribes prioritize in adaptation planning, how the priorities are communicated through their climate adaptation plans, and how these two Tribal climate adaptation plans differ from two comparable non-Tribal climate adaptation plans.

In my manifest content analysis of the four plans, I found distinct differences in how the four plans utilized the terms “system,” “resource,” and “vulnerable.” Through a latent content analysis, I categorized the various ways the key terms were used and found divergent approaches to climate adaptation planning: relational and technocratic approaches. The Akwesasne and Brooklyn-Queens plans met my hypotheses through their relational and technocratic approaches to climate change adaptation, respectively. The plans for the Shinnecock Nation and Albany, however, differed from my assumptions by somewhat combining the two approaches.

In addition to the two adaptation approaches I observed in all four plans, I also found three substantial themes employed in the Tribal plans: ecological adaptation, sovereignty, and cultural continuity. Both Tribal plans give significant attention to how their local ecology is impacted by climate change, with flexibility and optimism as to the landscape climate change may bring. Both plans prioritize discussion of sovereignty and self-determination at the very beginning of their documents. The significance of sovereignty flows into discussion of cultural continuity, which is framed as a means of adapting to climate change. Sovereignty and cultural continuity are embedded in Tribal concerns around food, with food sovereignty and traditional food staples as central issues.

## 7.2 Recommendations for Non-Indigenous Planners

### Support Regional Indigenous Neighbors

As shown through this research, Tribal nations, as with any sovereign nation, have their own priorities and approaches to climate adaptation planning, separate from those of U.S. municipalities. Albany and Brooklyn-Queens are, importantly, regional neighbors to the Akwesasne and Shinnecock Nation. The similarities and differences in how these governments within the same region are adapting to climate change has implications for regional resilience. Although adaptation efforts tend to be localized, there are transboundary resources, such as waterways, that must be planned for regionally. Non-Indigenous governments seeking to understand the priorities of their Tribal neighbors could facilitate collaborative partnerships for innovative regional adaptation strategies. Partnerships between non-Indigenous and Indigenous communities should not be limited to those with federal recognition; there are Tribes not yet federally recognized who are adapting to climate change (Davenport & Robertson, 2016).

### Respect Knowledge Exchanges

Hepler & Kronk Warner (2019) note that United States and state governments could learn from how Tribal nations use traditional knowledge, community participatory approaches, and promotion of cultural resource preservation in their adaptation planning. However, Williams & Hardison (2013) warn that while Indigenous traditional knowledges have led to proven benefits for adaptation projects, there must be safeguards for protecting these knowledges from exploitative misuse. For partnerships between Tribes and climate science organizations, (Kirby et al., 2019) found that there is a need for training to address cross-cultural expectations and challenges.

## Hold Responsibility for Political Reconciliation

Justice-centered action beyond simple recognition is necessary to engage, elevate, and enact Tribal climate adaptation priorities (Whyte, 2013). This thesis encourages responsibility from non-Indigenous planners and policy makers to address historic and ongoing injustices committed against Tribes and Indigenous peoples. There are two kinds of responsibility applicable here, as described by Whyte (2016). The first “requires settler states to live up to the ramifications of developmental paths that they continue to pursue and that are at odds with indigenous cultural and political self- determination” (Whyte, 2016: 1). The second “demands that settler states acknowledge that today’s political relations with indigenous peoples descend from structures of settler colonialism designed to limit indigenous adaptation to environmental change” (Whyte, 2016: 1). These paths offer ways that settler colonial states, and the planners and policy actors within them, can begin the process of political reconciliation, or the transformation of harmful relationships into morally grounded, respectful relationships (Whyte, 2018).

## Expand Notions of Adaptive Capacity

If resilience is the goal of adaptation planning, then non-Indigenous planners must not overlook the power of culture, ecology, and relationships for strengthening adaptive capacity, as these are features in non-Indigenous societies as well. Planners may reflect on their own experiences with extreme weather events in their communities, or other moments when community resilience is tested. For example, I grew up in coastal Florida, where the public prepares for enormously disruptive severe storm events annually. When I recall especially intense hurricane seasons, I do not recollect how much inventory retailers lost or how my city’s economy fared in the subsequent months. Instead, I think of the family, friends, and neighbors who helped me through it with laughter and some decent food. I remember the devastation to the places I love. Often,

unexpected features were most shocking, such as my favorite boardwalk in tatters or the stop light I pass daily hanging off a wire. In Florida, our adaptive capacity for severe storms is improved by a *culture* of preparation and flexibility, by recognizing changes in our surrounding *ecology*, and by building and leaning on supportive *relationships*.

This thesis encourages non-Indigenous planners to expand their notions of adaptive capacity as exemplified by the Tribal plans. The two Tribal plans, and the Albany plan to an extent, showed that adaptation can be approached relationally: through relationships to place, social networks, and systems of relational responsibilities. Both Tribal plans were guided by community observations and prioritized ecological adaptation and cultural continuity in their adaptation strategies. Non-Indigenous planners must move beyond limited technocratic responses to climate change and show consideration for the enduring “*psychological, symbolic, and particularly emotional* aspects of healthy human habitats” (Agyeman et al., 2009: 509).

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