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Leading Climate Action Planning: A Case Study of Local Community Practices

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Leading Climate Action Planning: A Case Study of Local Community Practices

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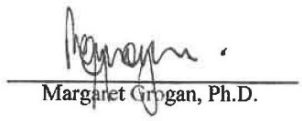

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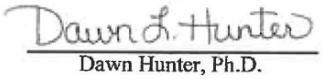

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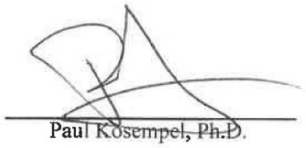

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For my Mom and Dad,

who, never for one minute, let me believe there was anything I could not accomplish.

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ABSTRACT

Leading Climate Action Planning: A Case Study of Local Community Practices

by Mackenzie Crigger

Given the increasing rate of anthropogenic climate change and the resulting climate impacts that communities around the world will be coping with over the next century, it is becoming increasingly important that communities, cities, and regions begin to develop climate action plans that will assist them in coping with climate impacts. As a result, it is becoming evident that understanding how to effectively develop a climate action plan (CAP) and engage a community in the climate action planning process is a question at the forefront for many municipalities. This research utilized case study to examine the process the City of Imperial Beach engaged in to draft its CAP in an effort to understand the strengths the city was able to leverage and challenges the city faced. A chronological time-series was developed to assist in understanding the critical events that must take place in order to develop a CAP. Findings revealed that the CAP process in Imperial Beach was a years' long effort championed by city council members and pushed forward by city staff and community members. The central themes found in this case study were community engagement, collaboration, environmental justice, and political polarization. Finally, the findings of this case study were viewed through the lens of complexity leadership theory in order to draw conclusions about the leadership needs in the CAP process.

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LIST OF ABBREVIATIONS

Abbreviation	**Meaning**
CAP	Climate Action Plan
CLT	Complexity Leadership Theory
GP	General Plan
LCP	Local Coastal Program
SLR	Sea Level Rise

CHAPTER 1: INTRODUCTION TO THE STUDY

> Often, we think of sea-level rise as a global issue. But this is a local issue. We will be dealing with this issue as a local community. This is something we are going to have to lead as residents, as local business owners, as homeowners. This is something that is going to come home to us.
>
> – Dani Boudreau, Coastal Management Specialist, Tijuana River National Estuarine Research Reserve (Srikrishnan, 2016)

Case Context

Imperial Beach is surrounded by water on three sides: the Pacific Ocean to the west, the San Diego Bay to the north, and the Tijuana River to the south (Solis, 2018). Imperial Beach encompasses nearly 4 miles of beach, and most activities are concentrated north and south of the pier and Boca Rio Beach, which boasts one of San Diego's best surf spots, according to the Imperial Beach city website (City of Imperial Beach, n.d.). The area around Imperial Beach Pier showcases the story of how the little city's big waves influenced surfing from 1937 to the 1950s. Just south of the pier, Border Field State Park allows beachgoers to speak through the chain-link fence to beachgoers in Mexico.

Imperial Beach is the most "southwesterly" city in California; therefore, making it the most southwesterly city in the United States (Schimitschek, 2017). It is located in the South Bay area of San Diego County, just 14 miles south of downtown San Diego, and 5 miles north of the city center of Tijuana, Mexico. It is only separated from Mexico by the Tijuana River Estuary. San Diego County is the fifth most populous county in the United States (U.S. Census Bureau, 2019), but Imperial Beach is a small city in the large county, with only 27,000 residents (U.S. Census Bureau, 2018b). The 27,000 residents of Imperial Beach live on only 4 square miles of

land (U.S. Census Bureau, 2018b). Of the total self-identified population where respondents can select more than one ethnicity, 62% are White, 49% are Hispanic or Latino, 4% are Black, and 1% are Native American (U.S. Census Bureau, 2018b). The median household income is just shy of $50,000 (U.S. Census Bureau, 2017). The median household income nationally in 2017 was $60,000 (Guzman, 2018). It was also reported in the 2017 American Community Survey (U.S. Census Bureau, 2018a) 70% of the population rents, rather than owns their home, compared to a national average high of only 37% of the population renting (Cilluffo et al., 2017). The largest industries in Imperial Beach are healthcare and retail.

To better understand the context in which Imperial Beach's climate adaptation planning process occurred, it is important to have a physical understanding of where this research took place. The following sections explore the history of Imperial Beach, what the city looked like at the time of this study, and the unique community composition that has helped the city craft an aggressive climate action plan in the face of limited resources.

Imperial Beach History

The modern history of Imperial Beach began in 1887 when R. R. Morrison, a real estate developer, filed a subdivision map for the area of south San Diego County that is now Imperial Beach (Daugherty, 1994). Morrison's intent was to build a beach retreat for people from Imperial Valley, and as part of the marketing strategy, the area was named Imperial Beach. In March of 1887, 2,000 laborers came to build Hotel del Coronado, the largest resort of its time. Many workers who came to construct the hotel made Imperial Beach their permanent home (Daugherty, 1994). These blue-collar roots have long defined Imperial Beach and in 2021, despite the vision of Morrison to make this community a retreat for the wealthy, it is one of the poorest coastal communities in Southern California (Srikrishnan, 2016).

The first part of the 19th century saw a tremendous amount of growth for the city including construction of a library, a general store, city sidewalks, and even a pier (Daugherty, 1994). The pier was originally built to house the Edward's Wave Motor, which was designed in hopes of using tidal power to generate power for city residents (Miller, 2004). The Mexico and San Diego Railway Company also operated a battery powered trolley, using technology recently (for the time) invented by Thomas Edison, to ferry people from South Bay Landing to the city center (Daugherty, 1994).

Prior to World War II, Imperial Beach was governed by the San Diego County Board of Supervisors (Daugherty, 1994). But in 1945, various social clubs were formed with the goal of bettering the community by influencing regulation and control of the city that came from the County Board of Supervisors. The Imperial Beach Civic Group set out to address the most pressing needs, and created a volunteer fire department and sanitary district, and set about naming streets. The city incorporated in 1956. On July 20 of the same year, the first City Council meeting was called into order, and the city's first mayor, Cecil H. Gunthorp, was unanimously elected (City of Imperial Beach, 1956).

Imperial Beach Today

At the time of this research, Imperial Beach prided itself on maintaining a small beach town atmosphere and sought to preserve that quality of life for its residents (City of Imperial Beach, 2019); however, as a result of the city's location there have been some inherent challenges to preserving and maintaining the beach community persona for which it is well known. Hasemyer (2018) noted Imperial Beach has historically dealt with environmental impacts in the form of storm surges because of its coastal location and has experienced years of cross-border pollution because of its proximity to Mexican factories. Over the last 30 years, Tijuana,

Mexico has grown rapidly and put a strain on the existing sewage system (Seifert, 2020). As a result, sewage pollution into the watershed is a common occurrence on both sides of the border, regularly closing beaches and causing human health concerns from contaminated water and aerosol spray.

The city has been facing another environmental reality: Rising sea levels. Even if CO_2 emissions stopped tomorrow, destructive flooding is expected to be routine by 2100. Rising sea levels could eventually impact 30% of the city's properties, submerge 40% of its roads, cause 15 miles of sewer lines to fail, and submerge an elementary school, among other structures, under water (Hasemyer, 2018). Roughly 700 homes and commercial buildings in Imperial Beach could be lost. The Tijuana River Estuary and the San Diego Bay could merge, and if that were to happen, the heart of the city's residential section would also be submerged (Smith, 2017). Mayor Dedina also noted roughly one third of the city faces ruin by flooding (Smith, 2017).

The city government has worked to understand the impact that rising sea levels and climate change will have on the city. In 2016, the Imperial Beach Sea Level Rise Assessment found beach erosion had accelerated to just over a foot a year. The report predicted by 2100, the rate of erosion would be 6 feet per year. Destructive flooding is expected to become routine by the year 2100, even if greenhouse gas emissions stopped tomorrow. Currently, in 2021, when the tide is high and the ocean is rolling, Descanso Avenue (the main street leading from the ocean) and some surrounding streets become funnels, sending ocean water into the city center (Duhaime-Ross & Doyle, 2019).

In the short term, the city must deal with issues like flooding and erosion that are already persistent problems for residents and businesses. Unfortunately, short-term solutions to flooding and erosion will not be effective for dealing with a 6-foot sea-level rise in the long run. As noted

in the 2016 Imperial Beach Sea Level Rise Assessment the practice of sand nourishment, which is where sand is brought in to create a new beach or widen an existing beach, would have the best benefit up until 2047. Buying and transporting sand is costly, though, and once other coastal cities start adding sand to their beaches in an effort to deal with their rising sea levels, the price will rise steeply. Managed retreat, or phased relocation of businesses and structures on the beach, prioritizes preservation of the beach, and ecological and recreational benefits associated with it, above protecting property (City of Imperial Beach, 2016). It also provides the city with the most economically feasible option for addressing sea level rise (SLR), though it is the least palatable option to deal with SLR for many residents.

If the city were to engage in a managed retreat strategy to move residents and business inland, development would need to relocate roughly three blocks inland to sustain a six-and-a-half-foot SLR (Smith, 2017). The city would then have to become denser, and city leaders would need to rebuild buildings, roads, and other infrastructure currently on the coast. As of this research, the city has applied for a grant from the Coastal Commission to update coastal zoning so it will be able to undertake infrastructure projects that would protect the coast.

David Revell, chief scientist at Revell Coastal and author of the Sea Level Rise Assessment, was quoted in a 2016 article saying, “The most cost-effective way to deal with sea-level rise and maintain city beaches in the long run is managed retreat – that is, let the beaches erode” (Srikrishnan, 2016, para. 29). In an article by Hasemyer (2018), Revell indicated, “Hard choices will have to be made. Some things will have to be sacrificed to the sea because the city cannot win a battle against the ocean” (para. 14). He continued noting the city can moderate some of the harm through tactical planning, but it includes accepting some losses.

Because Imperial Beach is surrounded by water on three sides, adapting to SLR requires trade-offs and money, a lot of money as Srikrishnan (2016) noted. Imperial Beach is one of the poorest beach communities in California, and the city "will need to decide whether to prioritize the economic benefits of tourism and beach recreation over maintaining the ecological value of beach and preserving existing flora and fauna, versus simply protecting buildings and property along the coast" (Srikrishnan, 2016, p. 2). The Imperial Beach City budget, which for fiscal year 2018–2019 was just over $24 million, now goes to fixing streets, trash pick-up, city workers salaries, police, and maintaining sidewalks (Imperial Beach City Government, 2017). Spending money to protect infrastructure would leave little room for luxuries, such as a new community pool, a playground, or upgrades to the senior center. A sea wall that would protect property would cost upwards of $50 million and would ultimately result in the loss of most, if not all, of the beach (Srikrishnan, 2016). Conversely, the city of San Diego has set aside $83 million this year alone for climate resilience measures including fortifying against SLR (Hasemyer, 2018).

Some wealthier Southern California communities, such as Malibu, have created special geological hazard districts (Srikrishnan, 2016). Special districts have allowed them to place a tax on residents to protect the coastline. But in Imperial Beach, where the average income is barely $50,000 a year (U.S. Census Bureau, 2019), increasing this tax is not a viable option. Demographics have shown 13% of the Imperial Beach population lives in poverty, even as the average price for a home has risen to $650,000 (Hasemyer, 2018). Hasemyer (2018) also noted the poverty rate jumps up to roughly 30% in neighborhoods along the bay front, which are the communities most impacted by projected SLR and storm flooding. In the face of these challenges, Srikrishnan (2016) noted how the city chooses to spend its limited budget is not easy. If the city chooses to spend money on maintaining roads that may soon be underwater, it means

less money for adaptation measures; however, if beach access roads are not usable, that cuts into tourism dollars that flow into the city, crippling it further.

In 2016, because of the strong El Niño weather pattern, the city lost 12 feet of sand from its beaches. According to an interview with Mayor Dedina, that sand loss was valued at more than $3 million (Guidi, 2018); however, Imperial Beach does have a natural gift to help protect its coast from erosion, which is the Tijuana River. During storms, the Tijuana River carries sediment and deposits it on the shores of southern Sea Coast drive (Srikrishnan, 2016). This acts as natural sand nourishment, but the Tijuana River also carries pollution from Mexico, which is also deposited in Imperial Beach, along with sediment. As a result, the city has tried to keep sediment from ever reaching its beach in an effort to protect its city and citizens from pollution, which necessitates using the increasingly expensive option of sand replenishment techniques.

Another issue making climate change a public safety issue in Imperial Beach has been the dozens of sites in and around Imperial Beach where handling of hazardous material is permitted (Hasemyer, 2018). The 2016 study on SLR showed locations, including military sites that handle hazardous material and have underground storage tanks that are vulnerable to flooding. If these areas flood, hazardous materials could be released into waterways with severe personal and environmental health consequences.

A Lawsuit in Imperial Beach

In an effort to put responsibility back on fossil fuel companies, in 2017 Imperial Beach, along with Marin and San Mateo counties, brought suit against Royal Dutch Shell, ExxonMobil, Chevron, and ConocoPhillips, among others (Smith, 2017). The complaint in *City of Imperial Beach v. Chevron Corp et al.* (2017) stated:

> Defendants have known for nearly 50 years that greenhouse gas pollution from their fossil fuel products has a significant impact on the Earth's climate and sea levels… With that knowledge, Defendants took steps to protect their own assets from these threats through immense internal investment in research, infrastructure improvements, and plans to exploit new opportunities in a warming world. Instead of working to reduce the use and combustion of fossil fuel products, lower the rate of greenhouse gas emissions, minimize the damage associated with continued high use and combustion of such products, and ease the transition to a lower carbon economy, Defendants concealed the dangers, sought to undermine public support for greenhouse gas regulation, and engaged in massive campaigns to promote the ever-increasing use of their products at ever greater volumes.

Because of a warming climate, Imperial Beach leaders forecast significantly greater expenses to deal with beach erosion, property loss, and the need to retool infrastructure such as wastewater and runoff systems (Smith, 2017). All of which Imperial Beach alleges in the court filing are the result of SLR caused by melting glaciers and a warming planet. Mayor Dedina alleged, "They [oil companies] knew about sea-level rise. They knew the damage it would cause, and they should be held accountable" (Smith, 2017, para. 6).

In the court filing, the plaintiffs also alleged company officials knew, or should have known, about climate impacts of their activities (*City of Imperial Beach v. Chevron Corp et al.*, 2017). The city also argued in certain cases, industry scientists conducted their own research decades ago and found links between carbon emissions and climate change. In addition, the lawsuit laid out a detailed timeline dating back to 1965, when President Lyndon B. Johnson told Congress the increased level of carbon dioxide (CO_2) in the air was the result of burning fossil

fuels (Rosier, 2017). The city used the fossil fuel industries' own admissions to show the industry was aware of the dangers in court filings.

Although Imperial Beach is not projected to suffer as much financial damage as other parts of the California coast, city officials said the economically challenged beach town lacks resources to adapt to the worst impacts of SLR (Young, 2017). The lawsuit seeks payment for ongoing and future flooding damage caused by storms and impacts from the more regular, predictable occurrences such as king tides. King tides are the highest tides and historically were seen only two or three times a year, but now occur more frequently and are responsible for increased flooding (Cent, 2017). In court filings against the fossil fuel industry, Imperial Beach said these flooding events are increasingly amplified by climate change and will dramatically drive down property values and could even put lives at risk (*City of Imperial Beach v. Chevron Corp et al.*, 2017). The suit also asked for punitive damages.

In May of 2020, oil companies lost their battle to have these cases moved to federal court when the Ninth District Court of Appeals found state courts are indeed the correct forum for this case (Melly, 2020). Oil companies had attempted to have the case sent to federal court where a judge had found in favor of the defendants in a similar case in Maryland. University of California Los Angeles (UCLA) environmental law professor, Ann Carlson, noted this ruling is significant because it opens the door for plaintiffs to begin the discovery process and depose executives to determine what they knew about impacts of climate change and when they knew it (Associated Press, 2020). Although this decision is a win for Imperial Beach and the other cities bringing suit, the case will likely drag on for many years before a final ruling is reached and any funds are awarded to help cities address climate impacts the city is facing.

Introduction to the Study

The impact of climate change on groups of people and communities around the globe is expected to increase in unprecedented ways in the coming decades (Wennersten & Robbins, 2017). As early as 1990, the Intergovernmental Panel on Climate Change (Tegardt et al. 1990) noted the greatest impact of climate change could be on human migration, with millions of people displaced by shoreline erosion, coastal flooding, and agricultural disruption. This data is particularly concerning as climate scientists have realized they have underestimated future human displacement due to rising tides by a factor of three (Kulp & Strauss, 2019).

Prior to the industrial revolution, climate change happened so gradually even plants had the ability to adapt, migrate, and survive during natural planetary fluctuations (Kolbert, 2015). The pace of anthropogenic, or human-induced climate change, is now so rapid that to keep pace with the present rate of temperature change, plants and animals would need to migrate toward the poles approximately 30 feet per day (Kolbert, 2015). As a result, Kolbert (2015) reported an estimated one third of all reef-building corals, one third of all freshwater mollusks, one third of all sharks and rays, a quarter of all mammals, a fifth of all reptiles, and a sixth of all birds are headed toward extinction. Additionally, it is important to consider the effects a changing climate will have on humans. A 2019 study published in Nature Communications estimates 190 million people will be living in areas vulnerable to SLR by 2100, and populations located in low-lying coastal areas are at particularly acute risk (Kulp & Strauss, 2019).

Efforts by local governments to adapt to climate impacts are crucial if they are to remain resilient and fulfil their role in protecting residents and assets (Noble et al., 2014). Recent scholarship also recognized the need for climate adaptation, but as Di Giulio et al. (2018) noted, understanding barriers, opportunities, and interventions that exist remains a challenge. The

authors also noted understanding the role social, economic, and political dynamics play in a city's response to climate change impacts is important. The work of Ford and King (2015) examined to what extent systems can adapt and how adaptation can be facilitated. As a result of this research, I explored how one city, Imperial Beach, is working to remain a resilient community through their climate action planning process.

Case study research on climate adaptation in the United States has been limited. Most research in the area of adaptation focuses on cases in Southeast Asia or the Pacific Islands because these communities are perceived as most critical (Currenti et al., 2019; Nakalevu et al., 2005). Other research examined cases in the European Union, where climate action has been swifter (Hofstede, 2016; Verstraete, 2016). However, the U.S. Department of the Interior did examine or explore coastal adaptation strategies for 24 sites in the National Park System (Schupp et al., 2015), and the state of Louisiana released a comprehensive plan for reducing flooding and maintaining a sustainable coast (Schleifstein, 2016). Using a case study design to understand the particular case of Imperial Beach helped to provide a more holistic view of how coastal communities in the United States can engage the community as they work to cope with and adapt to climate change impacts.

The question of how individuals, groups, and communities engage in the climate action planning process to cope with climate change impacts can best be understood using the case study method according to the work of Yin (2014), who advocated using case study method when studying behaviors and contemporary events that cannot be manipulated. Using the case study method to examine a community that has developed their first climate action plan (CAP), and was in the process of implementing it, provided valuable insights for other communities embarking on this process.

Background of the Study and Contextual Underpinnings

Though the impact of SLR on one community in the United States was explored, the impact of climate change on human life has become a global issue. By 2008, the United Nations (UN) estimated there were 20 million people already displaced due to climate change impacts. The UN High Commissioner on Refugees, Antonio Guterres (2011), declared climate change to be the "defining challenge of our times" (para. 20). A UN-backed study predicted there would be 50 million environmental refugees by 2020 from desertification alone (ELD Initiative, 2015). The U.S. Department of Defense's *Quadrennial Defense Review of 2014* called climate change a threat multiplier because it creates resource scarcity that very often leads to conflict. According to the U.S. Department of Defense (2014), effects of climate change will:

> influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world . . . [these events] will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions—conditions that enable other forms of violence. (pp. 8–9)

In short, a changing climate will have vast, varied, and unpredictable impacts across regions, countries, communities, institutions, and individuals worldwide (Intergovernmental Panel on Climate Change, 2019).

As instances of communities experiencing severe climate change impact become more common, governments are increasingly undertaking action to help communities adapt to the changing environment. In some cases where adaptation and mitigation are not possible, whole communities have relocated. By 2002, 4.4 million people were relocated from the environmentally unstable region of Gansu, China (Wennersten & Robbins, 2017). The Kiribati government purchased over 5,000 acres on Fiji in 2014 to cultivate food in the event of collapse

of their own agricultural system because of climate change, or potentially to serve as a new home for the people of Kiribati if increased flooding leaves their Pacific island uninhabitable (Wennersten & Robbins, 2017).

In North America, rising sea levels may force as many as 13 million U.S. residents from coastal areas by 2100 (Hauer et al., 2016). In 2016, the U.S. Department of Housing and Urban Development (HUD) awarded the Isle de Jean Charles Band of the Biloxi-Chitimacha-Choctaw tribe $48 million dollars to aid in resettlement, as 98% of their island is now under water (HUD Exchange, 2016*),* because of SLR. In the United States alone there are at least 18 other communities formally grappling with questions around what complete community relocation actually means for their communities (HUD Exchange, 2016).

Unfortunately, most communities lack funds to relocate, and even when funding for relocation is available, they often cannot agree on where to move and when to move according to Bastian (2020). For other communities who are committed to staying where they are, crafting a way forward in their current location is no small task either and requires years of research, community engagement, workshops, and a great deal of funding. Communities struggle to agree on what adaptation and mitigation measures to implement and at what point implementing agreed-upon measures makes sense. Developing a coherent, comprehensive strategy to address climate change impacts requires input from many different sectors of the community, which is not a quick or easy process.

To understand how climate action planning process happens in the context of this study, I used the framework of complexity leadership theory (CLT) put forward by Uhl-Bien et al. (2007). Adaptive capacity is crucial when coping with climate change and adapting to climate change impacts. CLT is a leadership framework that enables learning and adaptive capacity in

complex adaptive systems (CAS) in organizations and groups (Uhl-Bien et al., 2007). With the addition of complexity into leadership theory, a new understanding of leadership emerges. Leadership is no longer tied only to a person, but becomes linked to an emergent event (Lichtenstein et al., 2006). When leadership is linked with an event rather than a person, leadership can emerge from all levels of the organization and is the result of interactions among systems, not the result of bureaucracy (Uhl-Bien et al., 2007). At different times, individuals may find themselves serving as leaders and at other times as followers, depending on what is required and what knowledge, experience, and expertise they bring to the situation.

Climate change is the ultimate emergent event that requires identifying and exploring strategies and behaviors that foster group and individual creativity, learning, and adaptability. Because CLT seeks to foster system dynamics that enable structures appropriate for organizing and producing outcomes that directly tie to the vision and mission of the organization (Uhl-Bien et al., 2007), using it to think about climate adaptation, as in this study, helped to foster faster community learning.

Definitions of Terms

As this field of study is emerging, and the language is not always clear, defining terms is important in this study. The following section defines terms used throughout this study.

Adaptive Capacity: The Intergovernmental Panel on Climate Change (2007) defined adaptive capacity as "the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences" (p. 869). Similarly, Smit and Wandel (2014) defined adaptive capacity as "the conditions that a system can deal with, accommodate, adapt to, and recover from" (p. 287). Smit and Wandel (2014) suggested adaptive capacity is determined by assets,

such as information, resources (i.e., financial and technological), and context (i.e., social, political, environmental, and kinship networks) in which they are operating. As Chapin et al. (2006) noted, adaptive capacity depends on the amount and diversity of social, economic, physical, and natural capital available, as well as institutions, social networks, and entitlements that govern how capital is distributed and used.

Based on the work of Smit and Wandel (2014), the Intergovernmental Panel on Climate Change (IPCC; 2007), and Chapin et al. (2006), adaptive capacity can be understood to encompass the ability of people in a particular social and environmental system to respond to changes, shape those changes, and create changes in that system. Therefore, as Rahmawti et al. (2016) noted, a community's adaptive capacity to climate change (and its impacts) is the community's ability to adapt and recover from the effect of those climate change impacts.

Coastal Zone: Eighty-four percent of Imperial Beach is located in what the state of California defines as a coastal zone. This designation impacts how it experiences and addresses climate change. The coastal zone, as defined by the state of California, refers to land and water areas in California that stretch from the Oregon border to Mexico (California Public Law, n.d.). It extends into the sea approximately 3 miles offshore and includes all offshore islands. The region extends inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas, it extends inland to the first major ridgeline paralleling the coast or 5 miles from the mean high tide line of the ocean, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards (California Public Law, n.d.).

Climate Action Plan (CAP): The phrase climate action refers to any activity that helps people cope with a changing climate or resulting in a decline in greenhouse gas emissions as

noted by the Government of Canada (n.d.). A CAP is the strategy for how those reductions will occur on an organizational, local, state, or national level. A CAP generally includes targets for greenhouse gas emissions reduction and detailed actions that can be taken to help meet those goals. Plans may also include additional components such as resilience strategies, clean energy targets, and economic and social goals. Individual characteristics of each plan are based on opportunities the economy, resource base, and political structure provide for addressing climate change (Center for Climate and Energy Solutions, 2020). In the case of Imperial Beach, a CAP has been used to address the diverse and wide-ranging impacts of climate change on the environment, community, economy, and natural resources of the city (City of Imperial Beach, 2019). More specifically, the CAP for Imperial Beach establishes a roadmap for the City to meet 2020 and 2030 greenhouse gas reduction targets and become a more sustainable, adaptable, and resilient community.

Community: The idea of community features prominently in this project, and as such understanding how it is used in this research is important. There has been a great deal of research about what community is in the social sciences (Chavis & Wandersman, 1990; Putman, 2001). Community is not defined as a place, an organization, or a building, but rather a feeling and set of relationships among people who have been formed to meet a need (Chavis & Lee, 2015). Most people identify and belong to multiple communities. As Chavis and Lee (2015) noted, these communities can include neighborhoods, faith-based groups, political affiliation, race, ethnicity, or hobbies, among many others. Communities also form formal institutions like schools, government, and law enforcement. Communities are also nested in other communities. In a neighborhood, there may be racial or ethnic communities, or communities based on age or interests. In the context of this study, the term community refers very broadly to people who live

and work in Imperial Beach. The term city, also frequently used, refers to the city government. The city government, a term used frequently as well, is understood to be a part of the community, but is also its own nested community with the broader understanding of the term (Chavis & Lee, 2015).

Engagement Versus Participation: The terms engagement and participation are often used interchangeably, but for the purpose of this dissertation understanding the distinction is important. According to Lodewijckx (2020), the idea behind citizen engagement is people should have some power over decisions affecting their lives. Citizen engagement requires an active, intentional dialogue between the community and public decision makers. Engagement actually involves citizens in the decision-making process. To effectively engage the community in the decision-making process the city must provide tools, access to information, and the opportunity to speak to elected officials so community members can be engaged in an intentional way. Conversely participation is much more informal and is often not sustained consistently over the long term. Individuals may participate by taking a survey or attending a working group, but that does not always transition into sustained engagement.

Local Coastal Program (LCP): Imperial Beach used their LCP to develop their CAP. A LCP is a plan to guide development in the coastal zone and is established through California Public Law (n.d.). It establishes land use, development, and environmental policies for the area designated as the coastal zone by the California Coastal Commission. The Local Coastal Program Amendment to the California Coastal Commission is an update to the 1986 Western Shoreline Area Plan, which instructed cities to specifically address SLR and coastal erosion concerns along the coastal zone of their city.

Managed Retreat: Managed retreat is purposeful and coordinated relocation of people and buildings away from risks, as noted by Grieving et al. (2018). This may involve movement of a person, infrastructure such as buildings or roads, or even an entire community. It can occur in response to a variety of natural hazards (e.g., flood, wildfire, drought). In the context of coastal erosion, such as the case of Imperial Beach, managed realignment allows an area that was not protected from flooding to flood by removing coastal protection. This process is usually pursued in low-lying estuarine areas and almost always involves flooding of land that has at some point in the past been claimed from the sea. In the case of Imperial Beach, managed retreat, or phased relocation, "prioritizes preservation of the beach and its associated recreation and ecological benefits above property protection" (City of Imperial Beach, 2016, pp. 6-13).

Resilience: Similar to adaptive capacity and used together often in the discussion of addressing and coping with climate change impacts, resilience "is understood as the ability to absorb and cope with the unexpected" (Ensor & Berger, 2009, p. 17). Pelling and Uitto (2001) and Gallopín (2006) defined resilience similarly, as the ability of groups or communities to cope with external stresses and disturbances that result from political, social, or environmental change. Resiliency in many communities depends on flexibility of individual resource users and ability of the community to act collectively according to Kruse et al. (2017). Resilience can be influenced by many factors including perception of the associated risk of change; ability to plan, learn, and reorganize; and social, economic, and environmental dependencies.

Taken together, when adaptive capacity is fostered, it becomes a mechanism for building resilience because it expands to opportunities and options available for communities coping with, adapting to, or working to mitigate impacts of climate change (Colburn & Seara, 2020). In doing so, it increases the ability of the community and individuals to cope and recover. Therefore, if

there is a diversity of social, economic, physical, and natural assets in the community, the prospect of the socioecological system being able to gain resiliency characteristics through adaptation measures are improved (Ensor & Berger, 2009). As a result, adaptive capacity and resiliency are understood to be interdependent concepts.

Sea Level Rise (SLR): SLR refers to the increased average level of the world's oceans as a result of the melting of glaciers and ice sheets (National Geographic Society, 2019). SLR poses a serious threat to coast communities around the world through increased storm surges, flooding, and damage to sensitive coastal areas. One-way communities are working to address SLR through the development of a CAP.

Statement of the Problem

As aforementioned, the City of Imperial Beach is surrounded by water on three sides, and 84% of the city is located in what the California Coastal Commission refers to as the coastal zone (California Public Law, n.d.). Consequently, SLR and coastal flooding are two climate change impacts the city is already making plans to address through their CAP and LCP. A rising sea level will not only inundate homes, schools, and commercial businesses in the city, but it will also impact infrastructure like roads, utility services, and sewer lines, which are essential for the functioning of a city. If basic services cannot be provided, the small beach town atmosphere locals have come to cherish will cease to exist. Climate change and its resulting impacts are a big issue for the City of Imperial Beach, and it is important to understand how it has been addressed both for the city going forward and for other comparable coastal communities.

Though it is important to understand how these plans came to fruition and the city documented much of the process, it is not catalogued or presented in such a way for the planning process to be easily understood. There has also been no formal documentation on roles specific

groups and individuals played in development of plans. Additionally, based on document analysis and participant interviews, there appears to be no scholarly research or exploration of how the City of Imperial Beach engaged residents, groups, businesses, and the wider community to craft this plan. As a result, little had been understood about how this formal process unfolded.

Purpose of the Study

The purpose of this case study was to understand how the City of Imperial Beach engaged in their climate action planning process. Understanding how this community addressed climate change impacts and what level of engagement community members and groups had in the climate action planning process, may provide local, regional, and federal governments, and NGOs better strategies to support other communities facing similar challenges.

As noted by McNamara (2013), a wide variety of communities in locations across the United States are experiencing climate change impacts, but few of them have been able to address the challenge holistically. Understanding how communities address climate change impacts and engage their residents in the process of climate action planning is critical to addressing the challenge of climate change adaptation. Understanding how communities cope with climate change and its impacts has the potential to provide better modes of support and guidance for individuals, communities, and governments as they work to build climate resiliency and develop policies that provide support for groups experiencing climate change impacts (Republic of the Marshall Islands, 2014). Because it is expected many communities will suffer climate change impacts in the coming decades, understanding how Imperial Beach engaged local community members in their planning process may have implications for other communities in similar situations. Although the Imperial Beach strategy and process has not been without its

challenges, this study found there are many processes and actions other groups could use in climate action planning.

Research Questions

In light of the increased impact of climate change on communities in the United States, understanding how communities cope with, and adapt to climate change is becoming increasingly important. In light of this urgency, research questions for this study are as follows: To what extent did the community of Imperial Beach engage with the climate action planning process? What kinds of activities, practices, and procedures did the city and its residents use to develop a CAP and LCP? What activities, practices, and procedures supported the city and its residents in developing a CAP and LCP? And, how important was having an engaged community in this process?

Significance of the Study

Climate change seemed to loom in the distance, a problem for the distant future; yet, its impacts are now a problem of today. Without an understanding of how climate change affects lives of individuals and communities, it will be difficult to create policies, programs, and networks of support that can assist impacted populations in a way that is actually helpful for them. The significance of this study laid in two distinct but profound areas: (a) understanding how climate change impacts people and communities, and (b) how people and communities address climate change.

This study also helped inform how state and local leaders address the issue of climate change in their own communities, and national leaders working on policy to support local action. This study also has implications for international and domestic policy makers, because they will be responsible for crafting policy to support these communities and individuals, and may be

instrumental in creating pathways for adaptation planning and resiliency building for communities and individuals coping with climate impacts. Knowledge about how a community and individuals in that community adapt to climate change and build resiliency in the community may help make policies more robust and successful. Because there have been few United States based studies on climate change adaptation planning, this issue has not been well understood, this study added to the limited body of literature and helped bring voices of those directly impacted by climatic changes to the forefront of the discussion. The following chapters will explore existing literature that was important in the conceptualization of this study, explain the methodology that guided this study, and discuss the original research and findings resulting from the study.

CHAPTER 2: LITERATURE REVIEW

This literature review explores the existing body of work around climate change, and adaptation and resiliency. In addition, this chapter also discusses complexity leadership theory (CLT) and its relevance to the previously mentioned topics. CLT will be used as a framework to analyze data from this study. As this review will demonstrate, though there is some literature on climate change adaptation and resilience, most of it has not focused on urban areas in the United States and instead focused on rural areas in the global South. Therefore, this study aimed to fill this gap.

Key Areas of Literature

Three key areas will be explored in this literature review: (a) climate change science and the range of possible impacts a community may face, (b) climate change adaptation and resiliency as separate but interconnected areas of literature, and (c) complexity leadership theory. Most communities do not undertake climate change adaptation planning lightly and few plans, or strategies, are developed without consulting technical experts, key community groups, and residents. Using CLT to view this process yielded an understanding that can be transferred to other groups in a similar situation. CLT is a framework that enables the learning, creative, and adaptive capacity of complex adaptive systems in knowledge producing organizations and groups (Uhl-Bien et al., 2007). Understanding these key areas, and where they intersect, is crucial for understanding gaps in research and why this research was important at the time.

Climate Change

Climate change is not a new phenomenon; however, humans have never encountered such rapid, global, anthropogenic climate shocks as they have in the last decade (Oreskes & Conway, 2012). According to the National Aeronautics and Space Administration (NASA) and

the National Oceanic and Atmospheric Administration, 2019 was the 2nd hottest year on record and the 4th consecutive year to set a new record for average surface temperatures (Fountain & Popovich, 2020). In July of 2017, the Swansea University-led Managing Impacts of Deep Sea Research Exploitation Project reported the Larson C ice shelf in Antarctica had given way and sent 5,800 square kilometers, or 1 trillion tons of ice, into the ocean (Sullivan, 2017). Therefore, it should come as no surprise sea levels are rising faster than at any point in the last 2,000 years, and the World Resources Institute predicted 54 million people worldwide could be at risk of flooding by 2030, which is nearly triple the current at-risk population (Luo et al., 2015). Additionally, the World Bank predicted there will be more than 143 million internal climate migrants by 2050 (Rigaud et al., 2018). Furthermore, the Intergovernmental Panel on Climate Change (IPCC) predicted climate change will have its greatest impact on human migration patterns and General James Mattis, the defense secretary for the United States, has called climate change a driver of instability worldwide (Johnson, 2017).

To understand the magnitude of potential climate change impacts, a basic understanding of climate science is necessary. This section of the literature review explores climate science and impacts of climate change. It is important to understand these climatic fluctuations are not part of normal planetary cycles, and these changes have impacts on real people across the globe (Kolbert, 2015). The earth has experienced an average temperature increase of 1.6 degrees Celsius from 1880 to 2014 (National Oceanic and Atmospheric Administration, 2018). Though a 1.6-degree increase might not seem like much, it is the heat equivalent to 400,000 Hiroshima atomic bombs exploding across the planet every day (Zanna et al., 2019). Using ice core sampling, scientists have tracked carbon dioxide (CO_2) emissions back 300,000 years and observed a consistent correlation with rising atmospheric temperatures resulting in SLRs

(Ferguson, 2013); however, the atmospheric temperature has never risen as quickly as it has since the industrial revolution. The last time CO_2 was this high, humans did not exist (Freedman, 2013).

Climate Change Throughout History

Earth's climate has changed throughout history. In the last 650,000 years, there have been seven cycles of glacial advance and retreat (NASA, 2019). Five of these have resulted in mass extinctions of planetary lifeforms (Kolbert, 2015). The most recent cycle ended abruptly about 7,000 years ago, which marked the beginning of the modern climate era and human civilization (Kolbert, 2015). According to NASA (2019), previous climatic changes are attributed to small variations in Earth's orbit that change the amount of solar energy the Earth receives. The current warming trend has been particularly significant because most of it is the result of human activity starting in the mid-20th century and proceeding at a rate that is unprecedented over past millennia (IPCC, 2019). Some impacts from these changes are discussed in upcoming sections, but to understand how a warmer atmosphere results in climate change impacts, a quick overview of the greenhouse effect is provided.

The Greenhouse Effect

The greenhouse effect is a natural process that warms Earth's surface, and it occurs through a similar process used in contemporary understanding of a greenhouse (Chavan, 2016). When the sun's energy reaches Earth's atmosphere, some of it reflects back to space and the rest is absorbed and reradiated by greenhouse gases. Greenhouse gases include water vapor, CO_2, methane, nitrous oxide, ozone, and some artificial chemicals such as chlorofluorocarbons (Chavan, 2016). Absorbed energy warms the atmosphere and Earth's surface, and fortunately for humans, this process maintains Earth's temperature at approximately 33 degrees Celsius

(approximately 50 degrees Fahrenheit), which allows for life on Earth. The heat-trapping nature of CO_2 and other gases was demonstrated by scientists as early as the mid-1800s (Graham, 1999). The ability of greenhouse gases to affect transfer of infrared energy through the atmosphere is actually the scientific basis that powers many of instruments flown by NASA (2018) that have helped scientists understand impacts of climate change.

The layer of greenhouse gases, primarily water vapor and small amounts of CO_2, methane, and nitrous oxide, act as a thermal blanket for Earth, absorbing heat and warming the surface to a life sustaining temperature according to Shepherd (2016). Certain gases in the atmosphere prevent heat from escaping. Long-lived gases, like methane and CO_2, which remain semipermanently in the atmosphere and do not respond physically or chemically to changes in temperature, are described as forcing gases of climate change. Gases, such as water vapor, which do respond physically or chemically to changes in temperature, are seen as feedbacks (Shepherd, 2016).

Though water vapor is the most abundant greenhouse gas, most importantly it acts as a feedback loop to the climate noted Chandler (2007). Water vapor increases as Earth's atmosphere warms, but so does the possibility of clouds and precipitation. When there is enough water vapor in the atmosphere, precipitation occurs. Water vapor is one of the most important feedback mechanisms to the greenhouse effect because it controls the water cycle. When the water cycle is disrupted, consequences are often devastating (Chandler, 2007).

CO_2, despite its popularity, is a minor but important component of the atmosphere (Chavan, 2016). CO_2 is released through natural processes ranging from human respiration to use of fossil fuels to volcanic eruptions. Humans have increased atmospheric CO_2 concentration by nearly 50% since the Industrial Revolution began (Shaftel et al., 2021). Carbon dioxide has been

the most important long-lived "forcing gas" of climate change because it is now so abundant as a result of human activity (Chavan, 2016).

Methane is a hydrocarbon gas produced both through natural sources and human activities, including decomposition of wastes in landfills and agriculture, as well as ruminant digestion and manure management associated with domestic livestock (Shaftel et al., 2021). On a molecule-for-molecule basis, methane is a far more active and destructive greenhouse gas than CO_2, but also one which is much less abundant in the atmosphere (Chavan, 2016). Similarly, Chavan (2016) noted, nitrous oxide is produced by soil cultivation practices, particularly, the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning. Like methane, it is not as abundant as other greenhouse gases, but it has the potential to increase rapidly as farming practices and energy generation strategies change, particularly in the global South.

Anthropogenic Climate Change

The argument of solar irradiance is often used to counter the claim of anthropogenic climate change (also described as human caused climate change), and historically solar irradiance has caused changes in the sun's energy output that might have led to past climatic events (Lean, 2009; Lockwood, 2010). For example, a decrease in solar activity is thought to have triggered the Little Ice Age between approximately 1410 to 1720, when Greenland was largely cut off by ice and glaciers advanced in the Alps. Several lines of evidence have shown current global warming cannot be explained by changes in energy from the sun (Oreskes & Conway, 2012); however, since 1750, the average amount of energy coming from the sun either remained constant or increased slightly. Secondly, if warming were caused by a more active sun, scientists would expect to see warmer temperatures in all layers of the atmosphere (Oreskes &

Conway, 2012). Instead, scientists have observed a cooling in the upper atmosphere and a warming at the surface and in lower parts of the atmosphere because greenhouse gases are trapping heat generated in the lower atmosphere. Furthermore, climate models—including solar irradiance changes—cannot reproduce the observed temperature trend over the past century or more without including a rise in greenhouse gases (Oreskes & Conway, 2012).

Global Climate Impacts

A rapidly changing climate means global impacts are vastly different across the planet. Ice cores drawn from Greenland, Antarctica, and tropical mountain glaciers show Earth's climate responds to changes in greenhouse gas levels (North et al., 2006). Ancient evidence can also be found in tree rings, ocean sediments, coral reefs, and layers of sedimentary rocks. This paleoclimate evidence reveals current warming is occurring roughly 10 times faster than the average rate of ice-age-recovery warming (Levy, 2010).

Although the planet's average surface temperature has risen about 1.6 degrees Celsius since the late 19th century, most of the warming occurred in the past 35 years, with the 5 warmest years on record taking place since 2010 (Shaftel et al., 2021). Oceans have absorbed much of this heat, with the top 700 meters (about 2,300 feet) of ocean showing warming of more than 0.12 degrees Celsius since 1969 (Levitus et al., 2017), which is nearly twice as fast as earlier estimates. The Greenland and Antarctic ice sheets have also decreased in mass. Data from NASA's Gravity Recovery and Climate Experiment showed Greenland lost an average of 281 billion tons of ice per year between 1993 and 2016; whereas, Antarctica lost about 119 billion tons during the same time period (Mohr, 2021). The rate of Antarctica ice mass loss has tripled in the last decade (Mooney, 2018).

According to the National Snow and Ice Data Center (2020), glaciers are retreating almost everywhere around the world, including in the Alps, Himalayas, Andes, Rockies, Alaska, and Africa. Satellite observations reveal the amount of spring snow cover in the Northern Hemisphere has decreased over the past 5 decades and the snow is melting earlier. Additionally, the site reported both the extent and thickness of Arctic sea ice has declined rapidly over the last several decades. As glaciers retreat and melt earlier, sea levels rise globally. In the last century, sea levels have risen about 8 inches; however, in the last 2 decades SLR rates nearly doubled what they did in the last century and are accelerating slightly every year (Nerem et al., 2018).

Also, since the 1950s, the number of record high temperature events in the United States has been increasing while the number of record low temperature events has been decreasing (Shaftel et al., 2021). The United States has also witnessed increasing numbers of intense rainfall events (Wuebbles et al., 2017). Since the beginning of the Industrial Revolution, the acidity of surface ocean waters has increased by 30% and the amount of CO_2 absorbed by the upper layer of the oceans has been increasing by about 2 billion tons per year (Sabine et al., 2004). As oceans warm and become more acidic, sea life habitats will shift, reproduction and migration patterns will be interrupted, disease outbreaks become more common, and communities that depend on fishing and fisheries will suffer economically (Hönisch et al., 2012).

As a result of these changes to the global climate system, the IPCC (2014) has warned more droughts and heat waves can be expected, precipitation will increase, and tropical storms will become more intense and increase in frequency. According to Banis (2018), the 10 biggest disasters of 2018 cost $85 billion. As droughts and precipitation increase, agricultural cycles will be disrupted, and crop yields will be reduced noted Leng and Hall (2019). Increased $C0_2$ has also been associated with reduced protein and nitrogen content in some crops, which means a

reduction in nutritional quality. As Leng and Hall (2019) stated, all of these affects have direct impacts on human life and are the direct result of humans emitting more CO_2 into the atmosphere. Those most at risk for challenges associated with climate change impacts are people and communities in low-lying coastal areas (Elrick-Barr et al., 2015). The following section presents ways at-risk communities have worked to adapt to climate change and build resiliency to climate change impacts.

Adaptation and Resilience

As noted previously, the IPCC (2007) defined adaptive capacity as the ability of a system to adjust to climate change, to take advantage of opportunities, to moderate potential damages, or to cope with the consequences. Similarly, Smit and Wandel (2014) defined adaptive capacity as what a system can deal with, accommodate, adapt to, and recover from and suggested adaptive capacity is determined by assets and the context in which they are operating. As Chapin et al. (2006) stated, adaptive capacity depends on the amount and diversity of social, economic, physical, and natural capital available, as well as institutions, social networks, and entitlements that govern how capital is distributed and used. Based on this understanding adaptive capacity can be understood as the ability of people in a particular social and environmental system to respond to changes, shape those changes, and create changes in that system.

When adaptive measures are discussed, they refer to separate, specific actions such as early warning mechanisms for floods, changing water gathering techniques, or relocating structures (Salimi & Al-Ghamdi, 2020). These adaptations have a beginning and end, are geared to address particular impacts or confront specific vulnerabilities, and should evolve along with climate impacts.

Ensor and Berger (2009) defined resilience as "the ability to absorb and cope with the unexpected" (p. 17). Pelling and Uitto (2001) and Gallopín (2006) defined resilience as the ability of groups or communities to cope with external stresses and disturbances that result from political, social, or environmental change. Resilience in many communities depends on the flexibility of individual resource users and the ability of the community to act collectively (Kruse et al., 2017). Salimi and Al-Ghamdi (2020) wrote climate change resilience can be thought of as an iterative process influenced by many factors, including perception of the associated risk of change; ability to plan, learn, and reorganize; and social, economic, and environmental dependencies.

As stated by Ensor and Berger (2009), these two concepts work together because when adaptive capacity is fostered, it becomes a mechanism for building resilience as it expands opportunities and options available for communities coping with impacts of climate change. In doing so, it increases the ability to adapt and recover. Therefore, if there is a diversity of social, economic, physical, and natural assets in the community, the prospect of the socioecological system being able to gain resiliency characteristics through adaptation measures are improved. As a result, adaptive capacity and resiliency can be understood to be interdependent concepts.

Localized Knowledge

Using localized knowledge, the beliefs, perceptions, and concepts of the systems around them that the community possesses, as part of the problem-solving process for adapting to climate change is crucial (Opare, 2018). Agrawal (2008) stressed adaption is inherently a localized endeavor and if the community is not involved in the adaptation planning process it will likely not be successful. Similarly, Opare (2018) and Brugger and Crimmins (2015) noted, because climate change impacts are by their very nature disruptive to the local community, there

is a need to use available local knowledge from diverse sources to enable society to adapt to challenges associated with climate change. Son et al. (2019) noted, in particular, indigenous knowledge has the potential to further sustainable local development, and many communities already have contextualized relevant knowledge for addressing climate change impacts. The studies cited found bringing technically skilled individuals and vulnerable groups together produced better outcomes for the community (Brugger & Crimmins, 2015; Opare, 2018; Son et al, 2019).

Similarly, Opare (2018) argued local coping and adaptation strategies were more culturally appropriate and successful through the case of the Dupong in Ghana. The Dupong community members were able to identify climate change impact indicators that were precursors to changes in their water supply. As a result, they adopted strategies such as rainwater harvesting and increased the role of men in household water collection. These adaptations helped Dupong minimize adverse impacts of climate change on their water supply. Opare (2018) argued these adaptation strategies could be leveraged and improved upon as useful coping mechanisms for the community in dealing with other climate change impacts.

Similarly, Brugger and Crimmins (2015) argued bottom-up efforts led by local governments, local representatives, community organizations, and even households or individuals are more effective because these groups have access to local knowledge and resources. As a result of localized knowledge, Brugger and Crimmins (2015) found groups were better able to connect and coordinate with neighboring communities in the planning and policy creation process which drove a more successful end result. In the study by Son et al. (2019), the authors determined communities in the Back Kan Province in Vietnam will often ignore government suggestions and instead rely on local knowledge; however, there have been

instances of communities combining local knowledge with new scientific technology in an effort to alleviate effects of climate change. Son et al. noted combining technology with local knowledge made the community more capable of adapting to climate change impacts they were experiencing. Son et al. stated building on existing traditional and local knowledge is an important component for mitigating risks in minority populations.

Brugger and Crimmins (2015) took this idea one step further and argued existing social capital and organizational structure were distinct advantages for addressing local-level adaptation planning. They asserted if communities were able to pair research and relevant local knowledge to inform the planning and implementation process, the community would have better adaptive outcomes. Son et al. (2019) determined working within a collaborative framework that used new technology and local knowledge for supporting the problem-solving process, it enhanced local community access to relevant knowledge. Using science to provide ongoing evaluation while connecting to local insights ensured the planning and implementation process had higher rates of success in the communities they studied. Similarly, Salimi and Al-Ghamdi (2020) found having a framework that incorporated a locally led collaborative procedure into the planning process brought technically skilled individuals and vulnerable groups together. Given that culture, environment, and identity are intertwined, policies that ignore the importance of local knowledge are unlikely to succeed (Son et al., 2019).

Similarly, Pattison and Kawall's (2018) research called for a reimagining of local climate action planning in a way that enhanced autonomy of community members. The authors argued increased autonomy among community members leads to more equitable local climate action planning that can address both environmental and social justice issues. Pattison and Kawall specifically looked at local programs and policies that were explicitly working to reduce

greenhouse gas emissions while addressing affordability issues in the housing market. The authors further argued increased autonomy in these communities where climate adaptation planning was occurring could lead to residents who were more empowered and, therefore, more likely to engage with the public planning process.

Community Engagement With Climate Action Planning

Community engagement is an important part of climate action planning, but more research is needed in this area. Seng and Hanpachern (2018) found when city planners used existing social organizations to approach people about the climate planning process, people were more likely to engage. Hahn et al. (2020) determined a diverse set of stakeholders was critical for developing a climate action planning framework for the Anchorage, Alaska climate action plan (CAP). The authors noted to cultivate a diverse participant group, the city ensured translators and easy to read materials were available for all outreach activities and events. Hahn et al. (2020) also found providing childcare at sessions and holding meetings and workshops near public transportation, or in walkable areas, was critical to bringing new people into the conversation.

Educational and Industry Collaborations

Research on using academic research to drive decision making for climate change adaptation is sparse, but Watanuki et al. (2019) argued the need to promote an industry–academia–government collaborative framework to address climate change adaptation has been growing. The authors theorized climate change adaptation strategies are best developed by an interdisciplinary team of researchers, business leaders, and government agencies. They theorized teams currently working to address these issues do not include researchers who have more familiarity with cutting edge applications not yet available to businesses or governments. Hahn et al. (2020) found collaborative planning with local institutions that prioritized community

engagement can help craft a planning document that not only uses scientific expertise, but is also representative of the community it is meant to serve.

Governmental Cooperation

Although connecting technology with local insights is important to adapting to climate change impacts, doing so will not be enough to address the impacts according to some researchers. The global nature of climate change means adaptation will be necessary at all levels of social organization (Brugger & Crimmins, 2015) and, as a result, institutions are beginning to address adaptation planning at national, regional, state, and local levels. Bierbaum et al. (2013) noted bottom-up community planning and top-down national strategies that work in tandem are necessary to help regions deal with impacts of climate change.

Community adaptation efforts will require federal, state, and local agencies coordination as they incorporate climate change planning into their programs (Bierbaum et al., 2013). A lack of coordination at the national, state, local, private, and nongovernmental levels, and proliferation of often duplicative and sometimes contradictory adaptation approaches, can hinder implementation of timely adaptive actions (Bierbaum et al., 2013). To work successfully at broader scales, Pressey and Botrill (2009) found it is necessary to develop government structures that support collaborative approaches. This helps to facilitate adaptation planning and implementation across different administrative units, jurisdictions, and communities. Vancouver, Canada and Surrey, England both "made progress towards mainstreaming climate change information into policies and plans" (Oulahen et al., 2018, p. 416). This progress was facilitated by having political leadership coordinated across jurisdictions that supported the work city staff was tasked with doing to advance these initiatives.

Oulahen et al. (2018) noted in the absence of strong national support, local governments were building their own networks to address the complex, independent challenge of climate change. The authors found local governments in Turkey were leveraging municipal government networks to collaborate in the development of relatively progressive local policies on climate change adaptation and planning in the absence of support from the national government. Similarly, Smucker et al. (2020) found connections between subnational government agencies helped to achieve greater integration for climate change adaptation planning. Kalesnikaite (2019) determined a positive association with a higher level of collaborative activity among government agencies. Collaboration allowed cities to pool their resources and led to cross boundary collaboration. The author found this led to more positive policy outcomes as it related to climate adaptation planning specifically to address SLR.

Barriers to Climate Adaptation Planning

In general, barriers to climate adaptation planning includes lack of funding, policy and institutional constraints, inadequate collaboration, absence of senior level political leadership, lack of public awareness, and difficulty in anticipating the degree and scale of climate shifts and impending impacts (Bierbaum et al., 2013; Oulahen et al., 2018; West et al., 2009). In particular, the lack of sustained, multiyear funding and resources has impeded the ability of the community to advance climate adaptation planning, implementation, and monitoring. Fragmented jurisdictional control has also been a critical barrier to developing adaptation strategies and resilient systems that cross jurisdictional boundaries (Bierbaum et al., 2013).

Adaptation solutions should focus on development of new infrastructure, policies, and support institutions that facilitate, coordinate, and maximize benefits of the new systems of land management and use (Baca et al., 2014). As the authors noted, this can be accomplished by

improving governance and ensuring development programs take climate change into account when providing solutions. These solutions might be in the form of increasing investments in infrastructure and technologies, or providing more access to financial services, including insurance.

Oulahen et al. (2018) stated collaboration within and between levels of government is necessary to adequately address climate change impacts. The authors found when roles and responsibilities are distributed across several jurisdictions it makes it hard to know what each governmental agency is doing. Because no department had the mandate to take leadership or coordinate projects, there was ambiguity around decision making and who was accountable, which led to inaction. Oulahen et al. also found voters reward politicians for responding to disasters, not for investing in preparedness. Therefore, the incentive for local political leaders to divert tax dollars away from issues the public perceives as important, in an effort to prepare for climate impacts, has been greatly reduced.

Oulahen et al. (2018) noted a lack of public awareness created a barrier for action in climate adaptation planning. Public officials may limit their communication about climate change because of potential negative ramifications such as hurting the local real estate market or because they do not have a clear answer about the scale of damages (Bierbaum et al., 2013; Oulahen et al., 2018; West et al., 2009). Nevertheless, solutions require support of social organizations (e.g., civil society groups, cooperatives, small-business organizations) to enable households to access resources and knowledge necessary for adaptation while empowering communities to shape the direction of, in this instance, the coffee sector to meet their diverse development needs (Baca et al., 2014). In the case of coping with weather-related hazards, social networks play a primary role in adaptation and recovery. Social and institutional diversity itself

promotes resilience. Baca et al. (2014) asserted the decision of a community member to engage with an organization that provides improved access to resources and knowledge and a network that could facilitate recovery after climate shocks can lead to increased community resiliency.

Folke et al. (2003) identified four dimensions of adaptive capacity: (a) learning to live with change and uncertainty, (b) nurturing diversity for resilience, (c) combining different types of knowledge for learning, and (d) maintaining the opportunity for self-organization toward socioecological sustainability. Recently, the idea of social capital has gained importance in climate adaptation and resiliency literature. Kittinger et al. (2013), and Lockwood et al. (2015) all stressed the importance of a social capital and networks, institutions, and governance in determining a social system's ability to adapt to climate change.

Complexity Leadership Theory

Deciding on climate adaptation plans and coping measures to deal with climate impacts is no easy task, especially when considering the climate is a complex adaptive system (CAS). Many contemporary problems, like climate change, center on CASs said Holland (2006). A CAS is a living, adaptable, changeable system like an ecosystem, a social network, or a community. A CAS is characterized by a high degree of adaptive capacity, which gives the system resilience in the face of change. Communities, by their nature, are complex adaptive systems capable of producing knowledge, learning and changing (Holland, 2006).

Adaptive capacity is crucial to coping with and adapting to climate change impacts, so viewing this process through the lens of complexity leadership theory (CLT) may yield an understanding that can be transferred to other groups in similar situations. CLT is a leadership framework that enables the learning, creative, and adaptive capacity of CAS in knowledge producing organizations and groups (Uhl-Bien et al., 2007).

With the addition of complexity into leadership theory, a new understanding of leadership emerges. Leadership is no longer tied to a person, but becomes linked to an emergent event (Lichtenstein et al., 2006). When leadership is linked with an event rather than a person, leadership can emerge from all levels of the organization and is the result of interactions among systems, rather than the result of bureaucracy (Uhl-Bien et al., 2007). As Lichtenstein et al. (2006) noted, at different times individuals may find themselves serving as leaders and at other times as followers, depending on what is required and what knowledge, experience, and expertise they bring to the situation.

According to this definition, leadership can arise from anywhere within a social system. It does not need to be associated with authority or position, but rather arises from a complex interactive dynamic sparked by adaptive challenges. Adaptive challenges are often difficult to identify and require changes to values, beliefs, relationships, and happen across organizational boundaries (Heifetz & Laurie, 2001). It is important to note individuals act as leaders in this dynamic when they mobilize people to seize new opportunities and tackle tough problems. As the situation changes, different people may act as leaders by leveraging differing skill sets and experience (Heifetz & Laurie, 2001).

Climate change is the ultimate emergent event that requires identifying and exploring strategies and behaviors that foster group and individual creativity, learning, and adaptability. Because CLT seeks to foster system dynamics that enable structures appropriate for organizing and producing outcomes that directly tie to the vision and mission of the organization (Uhl-Bien et al., 2007), using it to think about climate adaptation may foster faster community learning. Most importantly, CLT puts forward the idea leadership is in the interactive spaces between people, ideas, and across whole systems, not tied to a person. Therefore, the interactive dynamic

of adaptive, administrative, and enabling leadership put forward in the theory of complexity leadership lends itself to addressing the challenge of responding to climate change impacts.

Because climate change is an adaptive challenge unlike any other, distinctive features of complexity leadership may allow for an understanding of how communities, groups, and individuals engaged with climate action planning in Imperial Beach. The framework of CLT provides an understanding for how adaptive leadership, administrative leadership, and enabling leadership can work together to address complex challenges. These three types of leadership, and how they work together will be discussed more fully later in this chapter. To understand the role of CLT in climate action planning, an understanding of complex adaptive systems is useful.

CAS and CLT

CAS, as explained by Uhl-Bien et al. (2007), are the basic unit of analysis in complexity science and are understood to operate like neural networks. These networks are independent, but active, cooperative, agents sharing a common goal, outlook, or need. Additionally, complex adaptive systems have changeable structures and overlapping hierarchies that emerge naturally within social systems (Holland, 2006). CLT allows for bringing in the "messiness, the back-and-forth, the reality" (Finkelstein, 2009, p. 77) into the leadership discussion by considering leadership within the framework of complex adaptive systems. Because CLT allows for messiness and overlap, using this framework to understand climate adaptation, the process may be better understood.

Ultimately, complexity leadership occurs in the face of adaptive challenges, and therefore, can be a critical piece for helping communities address the issue of climate change. CLT consists of three leadership theories—administrative, enabling, and adaptive—working together. Adaptive leadership is emerging and dynamic; whereas, administrative leadership is the

formal role of planning and coordinating. As noted by Uhl-Bien et al. (2007), enabling leadership helps to manage the "entanglement between administrative and adaptive leadership by fostering enabling conditions and managing the innovation-to-organization interface" (p. 306) across and within people and actions. Each piece of this leadership framework serves an essential purpose for communities grappling with climate action planning. Without all three pieces functioning together, communities will struggle to adequately address this challenge. Each piece of this framework and its role in addressing the adaptive challenge of climate change adaptation is explored more fully.

Administrative Leadership

Administrative leaders hold formal roles in the organization or group (Dougherty & Hardy, 1996). These are people often expected to provide solutions and held responsible for strategic planning and coordination, building vision, acquiring resources, and managing crisis. In a professional organization these are presidents, vice presidents, and managers. In a community this position may be held by elders, mayors, community presidents, city council members, city staff, or some combination of these positions. There are multiple levels of administrative leaders in an organization and much of this style of leadership is top down and very structured. Administrative leaders are responsible for organizational conditions that allow adaptive leadership to flourish (Uhl-Bien et al., 2007). The importance of the role of administrative leaders in the discussion of climate change adaptation cannot be overstated. Many communities experiencing climate change impacts are indigenous cultures that have very clear hierarchical structures for decision-making or require city, state, or federal governments to approve and/or fund adaptation measures.

Pacific and Asian Islanders generally have much more collective decision-making practices than people in Western societies. Incidentally, Pacific and Asian Island communities are typically male-dominated hierarchical structures based on property and processes (McLeod, 2015). It is also not unusual for a chief to be the final decision maker on major decisions affecting an individual family or the whole community (McLaughlin & Braun, 1998). When Marshall Islanders living on Bikini Island were asked to move to another island the chief made the final decision to relocate the community (Tabucanon, 2014a). This move ultimately had dire consequences the community is still coping with today. If the chief had allowed for more adaptive practices to emerge during the decision-making process, a different result that better met needs of the community might have been achieved. Leveraging this authoritative structure may have benefits for the adaptive leadership model because if the formal leader supports this framework for decision-making, leaders from different areas of the community that possess expertise or technical skill may feel more comfortable rising up and sharing their knowledge. This helps the community learn faster and arrive at better solutions more quickly.

Enabling Leadership

The role of enabling leadership in the CLT framework is to foster an environment that allows adaptive leadership to emerge. Enabling leadership manages entanglements that exist between administrative leadership and adaptive leadership by smoothing the organization-to-innovation interface (Dougherty & Hardy, 1996). To do this, enabling leadership has to foster interaction and interdependence between existing networks and injecting tensions that help to stimulate the dynamic that will result in adaptive change (Uhl-Bien et al., 2007).

As Lichtenstein et al. (2006) found, enabling leaders to manage bureaucratic entanglements between administrative leaders and adaptive leaders of the group will often arise

during a change process. Managing entanglement involves two important roles. The first is creating appropriate organizational conditions that foster effective adaptive leadership in places where innovation and adaptability are needed. The second is facilitating the flow of knowledge and creativity from adaptive structures into administrative structures. Enabling leadership occurs at all levels of the organization or group, but this role will vary by position in the group.

For communities and groups dealing with climate change impacts, enabling leaders to play a key role in allowing adaptive leadership to function. For adaptive leadership to move the group into a space where it becomes an organization that learns and problem solves, knowledge has to flow between and through groups and individuals. Enabling leaders in communities addressing climate change impacts are uniquely positioned to facilitate the sharing of information between administrative and adaptive leaders given their knowledge of the local population and proximity to impacts of climate change and the effect they have on the community (Dannenberg et al., 2019; Sheehan & Rayner, 2017). Having new and different knowledge flow through the group is essential for helping change perspectives and viewpoints, and for learning new values and ways of being.

In a study by Austin et al. (2019) examining enabling leaders working to address public health issues that resulted from climate change impacts in Germany and Canada, the authors noted certain measures by enabling leaders quickened the development of adaptive capacity. One measure that proved important was developing and disseminating usable knowledge about how other local public jurisdictions were addressing climate change impacts. The authors also found it was important for enabling leaders to develop mechanisms to share knowledge between public health institutions and implement practices to bring together adaptive leaders from different public health sectors. When enabling leaders leverage their position to share knowledge between

adaptive and administrative units, perspectives can change and new values and ways of being can be learned.

Adaptive Leadership

Adaptive leadership is the most complex piece of this leadership theory (Uhl-Bien et al., 2007). Adaptive leadership theory puts forth the idea an emergent, interactive, nonlinear dynamic of leadership produces adaptive outcomes in social systems (Uhl-Bien et al., 2007). This theory grew out of an understanding of biological processes and developed to help individuals and organizations adapt and thrive in challenging environments (Heifetz et al., 2009). Traditionally, businesses and organizations used this framework when they were going through a change process because it lent itself to be used by both individuals and groups collectively; however, this theory holds great potential for communities addressing climate change impacts because climate change is the quintessential example of a challenge requiring an adaptive solution in a difficult environment.

The real challenge of adaptive leadership is it requires people to learn how to address conflicts in values people hold and reduce the gap between values people hold and the reality they are facing (Heifetz, 1995). It requires changing beliefs and behaviors through exposure of orchestrated conflict. This intentional exposure can provide leverage for mobilizing people and organizations to learn in new ways to address the adaptive challenge completely. Using this process to guide groups through goal setting and strategy development allows not only for an understanding of how the goal represents values of the group, but also whether or not this goal can mobilize people to face tough realities—rather than avoid them. Adaptive leadership has the ability to address challenges around climate change adaptation in an emergent, interactive, nonlinear dynamic that produces adaptive outcomes in social systems (Uhl-Bien et al., 2007).

Adaptive leadership used as part of CLT has the potential to provide a framework for communities coping with climate change impacts because this idea of leadership is not tied to one person, but rather arises from emergent situations and is initiated from the space between agents and events (Lichtenstein et al., 2006). Adaptive leaders are able to help those around them adjust their expectations while promoting their resourcefulness (Heifetz et al., 2009). As discussed by Heifetz et al. (2009), a result of the emphasis placed on stakeholder engagement in the problem-solving process, adaptive leadership is a powerful mobilizing factor for people and organizational units that have different needs, priorities, perspectives, and different ways of thinking about the issue and working to address a challenge.

In addressing the challenge of what climate change impacts mean for humans, being able to not only gather information, but also to understand how to use it in a way that galvanizes the group to make required changes is crucial. When the question of "how does the community respond to climate impacts?" is broached, having a framework that promotes resourcefulness and recognizes combined knowledge of the system helps to ensure the best decisions will be made and the adaptive challenge will not be treated as a technical challenge (Heifetz et al., 2009).

As noted by Heifetz et al. (2009), adaptive leadership arises from emergent situations. Climate change impacts are continuing to emerge and impact communities at accelerating speeds, though are somewhat predictable. Because adaptive leadership is not located in an individual leader and is initiated from the space between agents and the event (Lichtenstein et al., 2006), this theory allows communities to solve their own problems in a way consistent with their culture, beliefs, and values. Adaptive leadership allows the community to learn, adapt, and creatively solve problems together by going through a period of productive disequilibrium, which is discussed in the following section.

Productive Disequilibrium

As Heifetz et al. (2009) stated in their discussion about adaptive versus technical challenges, these two types of challenges create disequilibrium for an organization or social group. As communities around the world make decisions about how to address climate change impacts, this disequilibrium can catalyze the decision process and allow for an understanding of how change and decision-making processes are not linear. Pressure from disequilibrium has to be strong enough to move people outside of their comfort zone, but it cannot be so great that it paralyzes stakeholders and prevents action (Heifetz et al., 2009). As noted by Lichtenstein et al. (2006), agent interactions can generate tension through which novel information can emerge, and when those new ideas lead to positive change, adaptive leadership has occurred. Tension arising in the agent (i.e., the community) results in interactions that can function as a core driver for change in CLT.

Adaptive leadership can then use this tension to drive the interaction of agents (e.g., people, ideas) to address complex challenges in ways that produce new patterns of understanding and behavior. It is important to consider there is a proportional relationship between risk and adaptive change. Individuals resist change when they do not have sufficient input in shaping initiatives (Sirkin et al., 2005). The deeper the change, the greater the amount of new learning required; the more resistance, the greater the danger there is for leaders (Sirkin et al., 2005). People experiencing change try to avoid this perceived danger by treating an adaptive challenge like it is a technical one; however, change depends on people with the problem internalizing change (Heifetz & Linsky, 2017). To help groups of people internalize change, Heiftiz and Linsky (2017) determined an adaptive leader has to engage people in adjusting unrealistic expectations. As noted by the authors, the leader will be tempted to satisfy their uneasiness and

treat the situation as if it can be fixed by a technical remedy, but ultimately, this prolongs the inevitable and delays the process, wasting valuable time that could be spent learning and problem solving.

In the case of climate adaptation, the community expectation might be the ability to address challenges through mostly technical measures and remain in their homes. This may not be the case and the adaptive leader must be able to counteract the exaggerated dependency the group may have on finding a technical solution (Heifetz & Linsky, 2017). The adaptive leader will have to promote the resourcefulness of the group to help them find an adaptive solution. This takes time, trust, presence, and artful communication. The only people who will have the trust necessary to accomplish this in the community are those who are already community members (Heifetz & Linsky, 2017). The hope of adaptive leaders lies in their capacity to deliver disturbing news and raise difficult questions in a way people can absorb, which encourages the group to take up the message, internalize the change, and develop a positive solution, rather than ignoring and killing the messenger (Heifetz et al., 2009).

Adaptive Leadership and Climate Change Adaptation

Adaptive leadership functions best in a complex adaptive system, said Lichtenstein et al. (2006). A CAS is composed of agents, individuals, and groups of individuals who share common interests, knowledge, and/or goals due to their history of interaction and sharing of worldviews. Communities dealing with climate change impact fit the definition of a complex adaptive system. Agents, whether they are individuals or groups in the system, respond to both external pressures from the environment or from other things operating within the system. These agents also react to internal pressures generated through the struggle with interdependency and resulting conflicting constraints. An example of this is when needs of one agent conflict with needs of

another. These tensions, when spread across a network of interactive and interdependent agents, generate system wide emergent learning, capabilities, innovations, and adaptations. It is important to note such elaborations are products of interaction among agents, rather than being caused by specific acts of individuals described as leaders (Lichtenstein et al., 2006).

Heifetz et al. (2009) discussed the idea of being "on the balcony" in the adaptive leadership text. Being on the balcony allows the leader(s) to understand the network of advantageous relationships that currently exist and can be leveraged to help with mobilizing the organization or group to deal with the challenge at hand. From the balcony, leaders can see patterns, tempos, and how different groups and individuals respond to different stimuli. This idea is useful when it comes to solving challenges around a changing climate because to address the problem, using different knowledge, perspectives, and experience is not only advantageous, it is required. One example of this is the pairing of local, indigenous knowledge with technical expertise to determine what course of action makes most sense for a community.

Though being on the balcony is essential, Heifetz et al. (2009) also addressed the advantage of being on the "dance floor." When you are on the dance floor, you can see what is in your immediate vicinity, and you can take an action or make an intervention that leads to a change. Behavior on the dance floor reflects purpose, and from this vantage point, it is easier to understand how actions tie to goals and values. The adaptive leader cannot hope to make any lasting change without spending some purposeful time on the dance floor to understand where people are with the issue. For the adaptive leader, working to address the question of climate change adaptation, values of the community are on the dance floor and from that space they can shift people into new patterns of thought and behavior that further the goal of problem solving.

A Road Map for Using Adaptive Leadership to Address Climate Change

To fully use both the balcony and the dance floor in decision making around the question of climate change adaptation, Heifetz et al. (2009) delineated a plan that could be adopted by adaptive leaders working in this space. The authors designed a road map to deal with complex organization change that is promising when applied to adaptive challenges such as climate change impacts. The authors suggested first diagnosing the system and understanding the challenge the organization or group is facing, which to do, leaders must understand the current group structure, culture implications, and political dynamics, and also whether or not the system even possesses the ability to adapt. When individuals and communities think about climate change impacts, it is critical to understand sociocultural, political, economic, and ecological components of that decision. Therefore, understanding the current situation is incredibly important, and likely can only really be understood by people who are members of and living in the community.

The next step according to Heifetz et al. (2009) is to mobilize the system. To mobilize a system, the challenge has to be interpreted through multiple lenses. It is not enough to speak with a few people in the community. Rather, it is critical to have a wide understanding of how the community understands climate impacts they are facing and what those impacts mean politically, socially, culturally, and economically for the group as a whole, and for individuals in the group. It is through talking with individual community members leaders can understand an array of perspectives, tap into individual expertise and experience, and, ultimately, understand how to mobilize the community to deal with the impact of climate change. At this point it is also important for the leader(s) to surface inevitable conflict. If conflict is surfaced intentionally, it can be managed in a way that is constructive and generates change. If some attention and thought

is not given to how to surface and manage conflict, leaders run the risk of losing momentum and having their efforts sabotaged.

Finally, Heifetz et al. (2009) discussed leaders needing to see themselves as part of the system. For those leaders either already addressing the challenge of climate migration or for those likely to face the question in the future, adaptive leadership holds great promise for use in addressing this challenge because they are already part of the system. The leader(s) will also have loyalties, needs, vested interests, perceptions, biases and fears, and connections that will all influence how the problem is understood and how solutions are perceived. So, although seeing themselves as part of the system is crucial, it is also important to manage those individual needs. Lichtenstein et al. (2006) noted the adaptive leadership perspective takes time to formulate and occurs as participants define together who they are and what they are doing through their interactions. In this way, the emergence of a social object occurs through informing of a joint social identity. In many communities dealing with climate change impacts, this group identity already exists. Importantly, in those communities where it does not already exist, or it is not as strong, social objects arise through mutual interactions of its participant creators. This road map can help communities address these adaptive challenges in a holistic way.

As discussed previously, Stiller and Meijerink (2016) found when the city created the position of climate adaptation officers in Hess, Germany, it raised the profile of climate change adaptation throughout the city, and enhanced the adaptive capacity of the city. When the authors viewed this program through the lens of CLT, they found it involved all three types of leadership functions that make up CLT.

Addressing adaptive challenges requires experimentation, discoveries, and the ability to make adjustments and respond to different voices coming from different places in the

organization (Lichtenstein et al., 2006), or in the case of climate change impacts, the community. Without learning, changing, and adopting new values, behaviors, and attitudes adaptive challenges cannot be addressed. Using leadership frameworks can contribute to positive outcomes in communities grappling with climate migration. As noted by Lichtenstein et al. (2006), the community has to be able to learn, change, and adapt in a way consistent with their values, beliefs, and social structure, and adaptive leadership through the lens of complexity leadership may allow for that. The authors argued without learning new ways, and changing attitudes, values, and behaviors, people cannot make the adaptive leap necessary to thrive in the new environment. Ultimately, adaptive challenges are addressed as people and groups change from practices and viewpoints guided by well-worn neural pathways to an organization that learns.

Climate Change as an Adaptive Challenge

As discussed previously, adapting to climate change is not a technical challenge, but there is a long history of treating it as such. For example, in 1946, the United States asked the Marshallese people, living on Bikini Island, to relocate so nuclear weapons could be tested there. When the Marshallese arrived in Kili, their new home, the traditional social arrangement could not be replicated because of inadequate land area and the soil was infertile so growing their own food was not possible (Tabucanan, 2014b). Islanders were moved two more times, but were not consulted about what aspects of their island home were important to them and what systems should remain intact through each of the moves. The U.S. government treated this relocation as a technical challenge, and in doing so made assumptions about the population and made decisions that did not account for the social fabric or cultural practices of the islanders (Tabucanon, 2014a). If the U.S. government used principles of adaptive leadership, they would have

understood for the Marshallese, land is tied to the social structure of the island. This would have helped guide them to what informal networks were vital to social structures, and enabled them to take into account priorities islanders had for a new home.

As noted by Tabucanon (2014a), when adaptation measures "tear apart existing communities and social structures. . . . kinship groups are often scattered, and life-sustaining informal networks of mutual help, local voluntary associations, and self-organized service arrangements are diminished" (p. 16). Using principles of complexity leadership might make it possible to help communities dealing with adaptation measures avoid the profound sense of loss felt by Bikinians. Using the people of Bikini Island as a cautionary tale may help produce better results in communities coping with climate change impacts and grappling with hard decisions on what climate change adaptation efforts to undertake.

Diversity and Complexity Leadership

Within CLT, heterogeneity refers to differences in skills, preferences, and outlooks among agents (Schilling & Steensma, 2001). Enabling leadership can foster heterogeneity by building an atmosphere where diversity is respected and where interaction of diverse perspectives is prioritized (Uhl-Bien et al., 2007). Through creation of an atmosphere that tolerates dissent and divergent perspectives on problems, individuals can be tasked with resolving their differences and finding solutions to their problems rather than looking to an authority figure to resolve the problem (Heifetz & Laurie, 2001). Furthermore, enabling leaders in this process who are also able to recognize the consensus that may result from a lack of diversity in the group could bring other people and perspectives into the dynamic as necessary (Lencioni, 2012).

Díaz-Fernández et al. (2020) found businesses with a diverse management team were in the best position to develop strategic goals of the organization and therefore produced the best outcomes for the business. The authors also found successful organizational adaptation relies on diversity. Without leaders coming from diverse perspectives, adaptive challenges will not be adequately addressed. For many community members, however, the lack of formal leadership authority can be scary and cause leaders not to step into those informal roles because it might mean challenging authority and expectations of traditional group leaders.

As more communities begin to face climate impacts, transformations to existing systems will become necessary (Barnes et al., 2017) and a diversity of perspectives will enable better problem solving (Uhl-Bien et al., 2007). In many places these transformations are already necessary, but an adaptive leadership framework is not being used to guide local communities through this change process because these two areas, climate change adaptation and CLT, are not currently being connected through scholarly research. Bardsley (2015) argued system transitions "need to occur *in situ* to ensure local environments are not further degraded or people entrenched in places where systems are failing, and *ex situ*, as people, systems and infrastructure become more mobile to deal with changing circumstances" (p. 50). As a result of these changes needing to happen together, it is important the community learns and adapts together while prioritizing bringing together a diversity of viewpoints and perspectives.

Conclusions From the Literature

It is clear from the research climate change impacts are variable, but ultimately will change how people live and how communities function. There is a need to address the challenge from many organizational levels to come to holistic solutions. In communities dealing with climate change impacts using CLT can have a positive impact on the whole community and

potentially help preserve cultural and social groups. Adaptive leaders, as pointed out by Uhl-Bien et al. (2007), working in a complex system are primarily propagating new ideas and ensuring the community is accessing new ideas. Leaders hoping to address the challenge of climate change adaptation must be able to diagnose the essential from the expendable, and as a result challenge the status quo in their communities.

CHAPTER 3: RESEARCH METHODOLOGY AND METHODS

The pace of anthropogenic climate change is now so rapid, to keep pace with the present rate of temperature change, plants and animals would need to migrate toward the poles approximately 30 feet per day (Kolbert, 2015). As previously mentioned in Chapter 1, one third of all reef-building corals, freshwater mollusks, and all sharks and rays are headed toward extinction, as well as one quarter of all mammals, one fifth of all reptiles, and one sixth of all birds (Kolbert, 2015). This says nothing of the impacts a changing climate will have on humans. Although recent history and current research has indicated climate change will have a substantial impact on communities and adaptation choices, how these decisions around adaptation and mitigation measures are made, or will be made, is not well understood (Bardsley & Hugo, 2010).

Although there are organizations like Adaptation International that work to help communities address climate change impacts and the American Society of Adaptation professionals who share best practices and connect people working on adaptation strategies, there have been few case studies that look at community adaptation in the United States (Vogel et al., 2006). As a result, through this dissertation I explored how the City of Imperial Beach worked to create a climate action plan (CAP), local coastal program (LCP), and general plan (GP), helping the community adapt to and cope with impacts of climate change. The question of how individuals and communities cope with climate change impacts can best be understood using the case study method to examine a community currently in the midst of coping with a changing climate.

As mentioned previously, case study research on climate adaptation in the United States has been limited. Most research in this area has focused on cases in the Pacific Islands because these areas are perceived as most critical (Luetz & Nunn, 2020). As a result, the body of research

in this area focused on the United States is just beginning to grow (Vogel et al., 2006); therefore, this case study was well positioned to make a contribution to the limited amount of existing literature. Using a case study to understand the particular case of Imperial Beach provided a more holistic view of how coastal communities in the United States cope with climate change impacts.

This research design methodology was a case study because it is the preferred methodology when studying behaviors and contemporary events that cannot be manipulated (Yin, 2014). Citizens of Imperial Beach have no ability to stop the streets of their town from turning into rivers during high tide and storm surges, but the community has begun the process of determining what adaptation strategies will yield the best long-term results for their city, and help them adapt to sea level rise (SLR).

Reiteration of Purpose

Because the need to consider how communities cope with climate change and learn to live on a warmer planet will not be going away, it is important to understand influencing factors for community adaptation. Understanding factors that help communities address climate change impacts has the potential to provide local, state, and federal governments, as well as NGOs and community partners, the ability to provide better modes of support and guidance for individuals and communities experiencing, coping with, and adapting to climate change (Vogel et al., 2006).

SLR in a coastal city is not unique. What is unique is Imperial Beach, one of the poorest coastal communities in California, has one of the more aggressive climate action plans in the state and has committed to 100% renewable energy (Hernandez, 2019). Imperial Beach, unlike its neighbor San Diego, cannot afford to spend large sums on expensive adaptive solutions (Solis, 2018). Imperial Beach was only able to do the initial SLR study because of a grant from

the California Coastal Commission. Conversely, the city of San Diego, a mere 15 miles to the north, was ranked the fifth richest city in the United States in 2015 (Rawes, 2015) and has dedicated $83 million just to climate change adaptation measures in its 2019 budget. That is more than 4 times the entire budget of Imperial Beach for the 2019–2020 fiscal year (City of Imperial Beach, 2017).

Imperial Beach engaged in a multiyear effort to understand climate change vulnerabilities the city is facing (City of Imperial Beach, 2016). As part of this process, the city has attempted to understand community needs and desires. As a result, there has been value in understanding how the small city was able to develop a robust CAP, and how the community viewed that process. It was important to capture the way the community engaged with the climate change action planning process in ways relevant to their experiences, values, and desires (Vogel et al., 2006). As demonstrated by the research questions, there was a need to spend time in this community, talking to community members to understand if (and to what degree) their engagement with the CAP, LCP, and GP was influenced by their understanding of climate change, its impacts, and their ability to cope with, adapt to, and build resiliency to those impacts.

Reiteration of Research Questions

Using the case study method to answer my research questions provided the opportunity to look at this issue holistically. Research questions of "to what extent did the community of Imperial Beach engage with the climate action planning process? What kinds of activities, practices, and procedures did the city and its residents use to develop a CAP and LCP? How important was having an engaged community in this process?" provided useful information for governments, community groups, and NGOs as these groups work to support this population and other similar populations across the United States.

Discussion of Research Method of Choice

As a researcher, it is important to understand not only how the case study method was derived and challenges levied against it, but also how theoretical underpinnings influence case study design and execution. The upcoming sections discuss pragmatic theory and design theory, and how these theoretical frameworks influenced the study design.

Theoretical Framework

Yin (2014) noted the role theory development plays for case study methodology prior to beginning to collect data is to serve as a point of departure from other types of qualitative research, such as grounded theory. For case study research, "the theoretical propositions can represent key issues from the research literature or practical matters" (Yin, 2014, p. 38), and having the research grounded in theory can enable the researcher to better design the study, guide data collection, and offer strategies to analyze data in a better way. Conversely, Creswell and Poth (2018) advocated for using theory retrospectively to compare and contrast research findings. Stake (1995), in another point of departure, wrote theories can be completely absent from case study if the focus of the research is on describing a case and the surrounding issues.

Having a theoretical underpinning guiding the research provides the researcher with a starting point and can help inform the structure of the research in my perspective; however, the researcher has to be careful not to let the theory predetermine results of the study (Creswell & Poth, 2018). Case studies rarely produce an entirely new understanding of an issue, but it can be used to modify the understanding of an issue; therefore, theory can help point the researcher toward relevant issues (Stake, 1995). Though a case study is not a candidate for a statistical generalization (due to the fact cases cannot be considered sampling units because of the small size; Creswell & Poth, 2018), case studies can be used to "shed empirical light about theoretical

concepts or principles" (Yin, 2014, p. 40) and provide transferability to other cases. Yin (2014) further noted knowledge gained can potentially apply to a wider variety of situations as a result of theoretical underpinnings that guided the research. Also, the study's findings may corroborate, modify, reject, or advance the theory guiding the research. In the following sections the impact of pragmatic theory and design theory on the case design are discussed.

Pragmatic Theory

Pragmatic theory underpins this research and influences how I have conceptualized this study. Pragmatism comes in many forms, but ultimately, pragmatic theory is concerned with outcomes. The pragmatic philosophical movement claimed truth and value can only be determined by practical application and consequences (O'Leary, 2007) and that knowledge is useful when it helps people problem solve (Cornish & Gillespie, 2009). I was interested not only in how this research may help improve the lived experience of Imperial Beach residents engaged with the climate action and adaptation process, but also how it can help other communities address their own climate change impacts and planning struggles.

Similarly, the qualitative researcher who holds an interpretive view of pragmatism is concerned with the outcome(s) of research, or what works (Creswell & Poth, 2018). As York (2009) wrote, pragmatists believe ideas exist simply to help people interact. Theories and beliefs are then evaluated based on how adequately they allow individuals to interact with the world, practical implications of those beliefs, and if the belief allows people adequately and fairly solve their problems. Ultimately, for the pragmatic researcher, truth is not absolute, but rather a usable construct for understanding reality (McCaslin, 2008). Boisevert (1998) found experience weaves together environment, memory, reactions to physical conditions, interests, limitations, and things envisioned. As a result, experience does not reside in a person or a situation, but in the space of

interaction between the two. Thus, pragmatic inquiry is the result of seeking to understand complex, everyday experiences. Through this study, I sought to understand how climate action planning happens on a city government level, and ultimately, about understanding how one community arrived at their CAP. I also sought to understand how knowledge can help solve future problems and be used for practical application, which is discussed in Chapter 5.

Design Theory

It is also important to acknowledge the role of design theory in the theoretical development of this dissertation. Design theory, like pragmatic theory, grew out of experience, practice, and human interaction (Dalsgaard, 2014). The mission of design theory is to translate observations into insights and use those insights to improve lives stated Brown and Katz (2011). Design theory is the process of providing a solutions-based approach to problem solving and is helpful in tackling wicked problems. *Wicked problems* are often thought of as a class of interrelated social problems that cannot be solved with a single solution (Johansson-Sköldberg et al., 2013). Buchanan (1992) theorized using design theory as a framework for dealing with wicked problems, where a great deal of creativity is needed, might help people arrive at better solutions. How to cope with climate change is a wicked problem because it will require many solutions to address challenges of a warming planet.

Design thinking stresses the idea of putting people first, and states to solve wicked problems, one must seek out people who experience that problem every day (Brown & Katz, 2011). When needs of the impacted population are prioritized and they are active participants in solving the problem, Buchanan (1992) noted the design process changed from engineers producing results to impacted populations being active participants in the process. As a result, improved community outcomes were observed.

Buchanan (1992) further indicated to get to the critical learning that has to take place to solve wicked problems, design theorists eschew looking at the hump of the bell curve. Instead, design theorists advocate for looking at the edges—the extremes—in an effort to learn something new, different, or surprising. In extreme situations, things are examined more closely because they have not fallen into the trap of being thought of as routine or familiar. Design thinking is also useful because it blurs boundaries of collaboration and helps to create new coalitions that can solve problems in a dynamic way (Buchanan, 1992). As Brown and Katz (2011) stated, unleashing design thinking as a means of exploring new possibilities and creating new choices can bring new solutions to complex problems.

Furthermore, design thinking, when approached as a thought process, might be able to improve outcomes by helping individual decision makers reduce their cognitive biases (Liedtka, 2014). Liedtka (2014) delineated nine well documented cognitive biases that can impact decision making (see Table 1). Understanding how these cognitive biases can negatively impact decision making in the face of innovation may provide insight into data collected through this study. Recognizing my own cognition biases, which I explored in my positionality statement, was also important as I analyzed collected data to ensure I did not impose my own perceptions on the data. Design thinking is used to understand the findings of this study, which will be discussed in Chapter 5.

Table 1

Nine Cognitive Biases

Cognitive bias	Description	Innovation consequences
Projection bias	Projection of past into future	Failure to generate novel ideas
Egocentric empathy gap	Projection of own preferences onto others	Failure to generate value creating ideas
Focusing illusion	Overemphasis on particular elements	Failure to generate a broad range of ideas
Hot/cold gap	Current state colors assessment of future state	Undervaluing or overvaluing ideas
Say/do gap	Inability to accurately describe own preferences	Inability to accurately articulate and assess future wants and needs
Planning fallacy	Over-optimism	Over-commitment to inferior ideas
Hypothesis confirmation bias	Look for confirmation of hypothesis	Disconfirming data missed
Endowment effect	Attachment to first solutions	Reduction in options considered
Availability bias	Preference for what can be easily imagined	Undervaluing of more novel ideas

Note. Adapted from "Perspective: Linking Design Thinking With Innovation Outcomes Through Cognitive Bias Reduction," by J. Liedtka, 2014, *Journal of Product Innovation Management*, *32*(6), 925–938. https://doi.org/10.1111/jpim.12163

Case Study Methodology

Qualitative case study research involves the study of a case, or cases, in a contemporary context or setting (Yin, 2014). The method involves using detailed data collection strategies from multiple sources of information including, but not limited to, observations, interviews, documents, artifacts, reports, and audiovisual material (Creswell & Poth, 2018). Case study

research is interested in "how or why something happened or why it might be the case" (Thomas, 2011, p. 40). Stake (1995) stated the goal of a case study is to capture the complexity of a single case, understanding its activity in particular circumstances. Individual cases emphasize episodes of nuance, the sequences of happenings, and the wholeness of the individual context.

Stake (1995) also said a case is a bounded, integrative system with working parts, even when they do not work perfectly. Cases are used to understand something particular. A case can be concrete, such as an individual, an event, or a group, or it may be more abstract, such as a community, a system, a decision-making process, or a relationship (Yin, 2014). Notably, case studies are bound by time and place, and as a result of these boundaries, Stake (2006) argued case study research is not so much a methodology, but rather a choice about what is to be studied within those boundaries. Furthermore, cases to be studied in case study research are selected because they are typical, unique, experimental, or successful (Merriam, 2002; Yin, 2014).

Contemporary case study research is believed to have grown out of ethnographic studies in the early 20th century when anthropologists, psychologists, and sociologists were trying to gain an understanding of how individuals interpreted the world around them (Merriam, 2002). Hamel et al. (1993) cited case studies of anthropologist Malinowski's study of the Trobriand Islands. The method was also exemplified by French sociologist LePlay's study of families, and case studies of the University of Chicago, Department of Sociology from the 1920s through the 1950s. On the other hand, case study methodology faced strong criticism in the 1960s and 1970s because of its lack of generalizability in comparison to the increasingly popular quantitative research focused on experimental design (Yin, 2014).

Despite this, and in large part because of a changing culture in educational research, in the 1970s educational researchers embraced case study methodology as a way to evaluate

curriculum (Stake, 1995). Case study provided a range of tools that were suitable to answer questions of "why" and "how" in a real-world context valuable to educators (Grauer, 2012). Case study methodology allowed the researchers to place an emphasis on inductive exploration and holistic analysis as they explored participants' perspectives and how sociopolitical factors influenced success, or lack thereof, of educational programs (Stake, 1995). Development of case study research in education focused on the need to determine the impact of educational programs and provide evidence for policy and practical decisions that supported social and educational change indicated Harrison et al. (2017). This resulted in placing a greater emphasis on discovery and holistic analysis presented in thick descriptions of a case. The history of using case study for social change only adds to the strength of using this methodology to answer my research questions.

Yin (2014) stated case study is the preferred methodology when studying contemporary events and behaviors that cannot be manipulated, especially when "the boundaries between the context and the phenomenon may not be clearly defined" (p. 16). For residents of Imperial Beach, the phenomenon of coping with climate change and engaging with the city's planning and adaptation process cannot be easily separated. This issue is not something a resident can deal with on their own. Conversely, the city cannot develop climate action plans without input from residents, businesses, and other organizations in the city. Impacts of climate change could easily change the culture, economics, and experience of the City of Imperial Beach. These cascading changes could lead to a loss of culture, of values, and of community connection to the city.

Case study has a well-established history as noted previously and is a distinct form of empirical research, many researchers do not view this form of inquiry as a highly desirable methodology to use when conducting research, according to Yin (2014). Many argue case study

is not rigorous enough for the hallowed halls of academia because there is not one prescribed method for how to perform a case study, and therefore, it lacks rigor. As Yin (2014) noted, accusation of lack of rigor is not often levied at other methodologies, perhaps because more texts exist to guide the researcher in specific research procedures. Case study research has also been conflated with case studies used for teaching. The conflation of the two types of case studies is problematic because teaching cases are deliberately altered to demonstrate a point. For a case study researcher, reporting all evidence accurately and fairly is a necessary component and is a measure of quality of research (Yin, 2014).

Another common challenge to case study research is generalizations cannot be drawn from findings. Yin (2014) argued scientific generalizations are rarely drawn from single experiments and generalizations can be drawn from theoretical propositions in case study research. In this same vein, Yin noted it has been argued case study does not have a clear advantage over other research methodologies. Yin also argued those who put forward this criticism fail to recognize the limited ability of other methodologies to address the how and why of a research question, unlike case study, which is often focused on the how and why. Following the recommendation of Yin to use existing research to narrow the topic and hone the question, it became apparent the research questions had not been explored using case study methodology. Additionally, because of the influence of pragmatism and design thinking on my conceptualization of the research questions, case study provided the best option for answering the questions as completely as possible.

As noted previously, in qualitative case study research the researcher strives to appreciate the uniqueness and complexity of the embeddedness of the case and how it interacts with its context (Stake, 1995). The case context of the City of Imperial Beach coping with climate

change adaptation forces attention toward issues, problems, and concerns, while observing how the city struggles against constraints in addressing and coping with current and expected climate impacts. It is also important to articulate the case context in a way readers can develop a sense of being there (Yin, 2014).

This particular case context was limited by geography, time, and experience of engaging to some degree with the climate change planning and adaptation process. As subsequently discussed, I only collected data with people currently living in Imperial Beach who have been experiencing climate change impacts and/or have been participating in the planning process for determining adaptation measures for the city. Study participants' degrees of engagement have varied from highly involved in the planning process from beginning to end, to periodic engagement via workshops or correspondence with city staff. The next section discusses the research methods and design in more detail.

Research Methods and Design

Case study methodology has several defining characteristics outlined by Creswell and Poth (2018) and supported by Stake (2006) and Yin (2014). Every case study inquiry identifies a specific case to be analyzed. It may be a single case or multiple cases in the same context. As noted previously, case studies address a contemporary case that cannot be altered and is already in progress. Every case study will be located, or bound, within a specific timeframe and place. Case studies may be intrinsic or instrumental. An intrinsic case study deals with an unusual case that in and of itself needs to be described; whereas, an instrumental case study, like this one, aims to understand a specific problem or issue and the selected case is deemed the best one to help understand the problem (Yin, 2014).

A case study presents an in-depth understanding of the case as indicated by Creswell and Poth (2018). As the authors note, it is difficult to accomplish this without using a wide variety of data collection sources that can be used to triangulate data. As a result, case studies do not rely on a single source for data, but instead rely on a variety of data sources. Yin (2014) noted themes are important to case study research as well because they represent specific situations or issues in each case. He also stated boundaries between the phenomenon studied and the context might not be clearly defined in a case study. Finally, a case is a distinctive situation, where there will be many more variables of interest than data points (Yin, 2014).

For this study, documents were collected and reviewed in an effort to understand the context in which the CAP of Imperial Beach was being developed. Using documents as a starting point helped me to identify possible interview participants from city workshop sign in sheets and to draft initial interview questions. Field notes and journals were helpful in capturing emerging ideas and developing early codes. The upcoming sections detail the document collection and analysis process, how interviews were conducted and analyzed, and how field notes supported data collection for this research. The following section discusses general strategies for how data were analyzed.

Data Collection and Analysis Procedures

There is no one moment when data analysis begins, which was true for this study. Stake (1995) stated, "Analysis is a matter of giving meaning to first impressions as well as to final compilations" (p. 71) and it is an ongoing, iterative process. Because data came from a variety of sources, including participant interviews, city documents, news articles, and a research journal, a crucial piece of research design is to plan for how data will be collected in light of study

questions. As a researcher, it made sense to think about how I was planning to link data I collected to initial propositions.

The process of reviewing documents prior to beginning interviews, influenced how I structured my participant interviews. Because case study allows for collecting data in a variety of ways, it was important to plan this piece carefully. To use the example Yin (2014) provided, "the researcher may realize explanation building rather than simple pattern matching makes more sense because the study is an explanatory case study" (p. 36), as was the case in this study. In this case study, explanation building became important to understand exactly what happened. Additionally, it was important to the study to include appropriate time markers, because parts of this process were time series dependent. If I had not considered this aspect, I may have failed to collect critical time stamp information as I conducted interviews and performed document analysis. As a researcher, thinking through how I planned to analyze data before they were collected helped reduce analytical difficulties before they arose.

Given I anticipated climate action planning to happen in a variety of formal and informal ways, thinking about different ways data might be collected, whether it was through interviews, document analysis, news articles, or videos was crucial to deciding how I would catalogue data collected so they could be analyzed. Ultimately, I relied on NVivo to hold all my documents and interview transcripts so I could code everything in one place and search based on codes. This was helpful in developing categories and themes, and is explained more fully in subsequent sections, which focus on each data type.

Creswell and Poth (2018) recommended thinking of data collection as a series of interrelated activities that go beyond simply conducting interviews and making observations, and instead to think of it as an activity that will provide enough information to answer the research

question. As Thomas (2011) noted, there is a difference between data and evidence. Data are merely pieces of information, but evidence supports or refutes the question of the study. Therefore, it is important to think about data collection in a systemic, structured way that can provide evidence for conclusions of the study. Using documents to support interview statements helped to triangulate and confirm findings of this study.

This study was focused on document analysis, interviews, field notes, and journaling for data collection. These pieces worked together to develop an explanation of how climate action planning occurred in the City of Imperial Beach. Document analysis provided background information and reliable time stamp information that could be used to verify participants' memories of CAP events. Interviews were important for explanation building and theme development. Field notes and journaling were helpful in capturing emerging ideas and ensuring important insights were not lost. These data collection and analysis processes are explained in subsequent sections.

General Strategies for Analyzing Data

Yin (2014) discussed four strategies for analyzing case study evidence. Those strategies include relying on theoretical propositions, working the data from the ground up, developing a case description, and examining plausible rival explanations (Yin, 2014). Three analytic strategies, relying on theoretical propositions, developing a case description, and working the data from the ground up, were used on data in this instrumental case study. The two strategies of working the data from the ground up and developing a case description were integrated to analyze data collected in this study. The goal of this research was to develop an instrumental case description of the climate action planning process, and the case description was created through the process of working the data from the ground up.

As noted by Yin (2014), one strategy to follow when designing a case study is relying on theoretical propositions. In this study, those theoretical propositions were design thinking and pragmatism. These two theories reflected the research questions that guided this study, helped to inform and organize analysis of this study, and pointed to relevant data. Working the data from the ground up allowed me to understand circumstances that helped in the development of a CAP. Because this data analysis strategy was inductive, as noted by Yin (2014), it covered behavior and events this researcher was trying to understand. Upon further analysis, it became evident a descriptive approach would help to identify the appropriate explanation for this case study due to complexity surrounding development of the CAP in Imperial Beach. It became clear through further analysis the complexity of the process could be described in terms of what had to happen in the community for the planning process to be considered a success. The descriptive approach was used in this research to explain where the CAP process had success and where the process could be improved in future planning efforts.

Yin (2014) also discussed five analytic techniques that can be used to build a compelling case analysis. Of five techniques suggested by Yin (2014), explanation building was used to explain how and why the CAP process happened. This strategy was useful because causal links in the CAP process are complex and imprecise. The causal links uncovered in this research reflect critical insights into the public planning process the City of Imperial Beach, and other cities undertaking a CAP process, might leverage as part of their public planning process in future iterations. Knowledge uncovered could yield contributions to CAP frameworks and theory, but because explanation building is an iterative process (Yin, 2014), this single case study does not end conclusively and it is important to note other plausible explanations might exist.

Yin (2014) noted the analytic technique of time-series analysis, specifically chronological sequences, and how it can help answer relevant how and why questions in relation to events over time. Chronological sequences allow the researcher to trace events over time and serve as a descriptive device in a case study "whose purpose is to describe a phenomenon (the 'case') in its real world context" (Yin, 2014, p. 238).

Creating a chronology is not solely a descriptive device. As Yin (2014) noted, the time-series can explore presumed causal events "because the basic sequence of cause and effect cannot be temporally inverted" (p. 154). Additionally, a chronological series is likely to cover different types of variables and as a result can be richer and offer more insight than a general time-series approach. The goal of the chronological time-series developed in this research, derived from document analysis, was to understand if "some events must always occur before other events" (Yin, 2014, p. 154) and if "certain time periods in a case study may be marked by classes of events that differ substantially from those of other time periods" (p. 154). The chronological time-series developed from document analysis is located in Chapter 4. Data collection strategies and analysis procedures for document analysis will be covered in the next section.

Data Collection and Document Analysis for the Climate Action Planning Process

As noted by Yin (2014), document analysis is likely to be relevant for nearly all case studies and a systematic plan for document collection plays an explicit role in any data collection process. The CAP process was documented by the City of Imperial Beach in the form of meeting minutes, agendas, announcements, internal records, and drafts of plans. As a result, documents collected during this research were crucial to developing the chronological time-series that provided insight into critical steps in the climate action planning process in Imperial Beach. It is

important to note though documents cannot be considered bias free or completely accurate, they can serve to corroborate and augment evidence that comes from other sources (Yin, 2014), which was the case in this research.

City council meeting agendas and minutes, videos of past meetings, documents from workshops, advertisement and public notices, administrative documents, and news articles were all collected and reviewed as part of this study. These documents were crucial in constructing a chronological time-series line of activities because participants could remember certain events, but could not always note particulars around logistics and dates. As noted by Sheridan et al. (2011), timelines are a critical component of case study as they help to collect, manage, and categorize data.

Additionally, documents can assist with identifying people and organizations referenced in interviews, and in the case of this study, led me to additional participants, which is discussed in more detail in the following section on participants. Documents can also provide specific details that support information coming from other sources and from participant interviews. Documents can also help the researcher make inferences and find new questions to ask study participants. Documents reviewed as part of this case study were instructive in finding additional interview questions and corroborating information study participants shared. It is important to acknowledge, though, documents are written for a specific purpose, to achieve an objective, and directed to a particular audience, and thus, one cannot assume they contain the unmitigated truth. It was important for this research to consider who the communication was between and what the objectives of that communication were when reviewing documents obtained from the website and using open records requests.

City council meeting minutes and recordings of meetings are a matter of public record and were, therefore, typically easy to access via the city website at the beginning of this study. In the middle of document collection, however, the city website went under renovation and all meeting minutes and videos were removed from the city portal. Shortly thereafter, the COVID-19 pandemic hit, the majority of city staff began working from home, and the backlog of meeting agendas, minutes, and videos were not re-uploaded to the website. As of the writing of this dissertation, only minutes and videos from January 2020 to present were available. The Imperial Beach City clerk emailed me meeting minutes and documents that under normal circumstances could have been obtained directly from the website.

Prior to the website renovation, publicly available agendas were reviewed to determine which meeting minutes would be pertinent to this study. I primarily looked for agendas that had a discussion or voting item about the CAP, LCP, or GP listed. The agenda review was not finished when agendas were removed from the website, so I then had to depend on the City Clerk to review agendas and send me the appropriate minutes via a public records request. When those meeting minutes were obtained via the city website and email, I reviewed those sources to see what comments were being shared with the city council in a formal setting. I also used meeting dates to view City Council meetings that were streamed live to YouTube.

Despite the website renovation, the city maintained the *Resilient Imperial Beach* page. This section of the city website provided copies of proposed and final drafts of the CAP, GP, and LCP. It also included public comments the city received on various stages of drafts, a variety of community notices and newsletters that advertised community meetings and workshops the city was hosting about the plans, and city resolutions pertaining to the plans' implementation strategies. A partial list of documents reviewed during this process is located in Table 2.

Table 2

Documents Reviewed and Analyzed

Document name	Source
City Council Meeting Agendas & Minutes - 26	City clerk email and city website
Steering Committee Meeting Minutes - 3	City clerk email
City Council Meeting Videos - 12	YouTube
LCP/GP Drafts (032519 & 111919)	City website
CAP Drafts (032519 & 071719)	City website
Approved Climate Plan Resolution 2019-8054	City website
Final Draft- Land Use Plan/Implementation Tracking Spreadsheet 093019	City website
Staff Report MF 1234 CAP Mobility SR & Resolution 071719	City website
Approved Final Neg Dec RIB/LCP/CAP Reso 2019-8052-0717-19	City website
LPC/CAP Neg Dec Comments	City website
TAC DRB PRC Minutes & ALUC Consistency Determination	City website
Approved Mobility Element Resolution 2019-8053-071719	City website
MF 1234 Resilient Imperial Beach LCP City Council Notice 071719	City website
LCP/GP Drop in Series 061819	City website
Imperial Beach LCP/CAP 042419 Community Meeting Invitation	City website
Imperial Beach LCP/GP/CAP Draft Negative Declaration	City website
Coastal Commission Staff Comments 042919	City website
Climate Action Plan Survey (October 22, 2018) & Powerpoint Presentation	City website
Public Workshop Powerpoints	City website
LCP Workshop Notice - September 2018	City website
LCO Steering/Stakeholder Committee/Community Invitation	City website
Newspaper Articles - 52	Online news sites

I also attempted to review general public comments of city council meetings leading up to or following a meeting that had addressed the CAP, LCP, or GP in case a general comment was being shared with the city about those topics during general public comments. A general public comment period of a city council is a time when anyone can bring an issue to the city council that is not on the agenda for that meeting. This proved to be a good idea, because occasionally a public commenter would note they were not able to be at the previous meeting, but wanted to share their view on plans, concerns about climate change impacts, or opposition to the idea of managed retreat in a formal documented way. These comments were transcribed and coded as well.

I also reviewed upwards of 50 news articles about the climate action planning process of Imperial Beach. Quotes from residents and business owners were pulled from these documents and included in analysis. I also used these news articles to assist in developing and confirming the timeline of activities.

After reviewing this array of documents, I coded them using in-vivo style coding. In-vivo coding "uses words and short phrases from the participants' own language in the data record as codes" (Saldaña, 2016, p. 295). In-vivo, though applicable to most qualitative studies, was relevant to this study because of the variety of data sets being used (Saldaña, 2016). Initial coding, the first phase of in-vivo coding, breaks down data into discrete parts to examine them for similarities and differences. This was helpful in being able to triangulate documents with interview data because I could see similarities and differences between and among different data sources.

It should be noted initial codes developed during document analysis helped to inform codes developed and used during the coding process of participant interviews. Some codes used

during document analysis process were not used during coding of interview data. Not using some codes occurred primarily because there were individuals participating in the public comment process that did not view the climate action planning process positively. Study participants primarily viewed the climate action planning process favorably, even when noting flawed elements of the process. It should be noted public comments are short, typically limited to 3 minutes, and many times were cut off before speakers finished their thoughts because they ran out of time. There is also no opportunity to follow-up with a question that might be raised during or as a result of a public comment. Because I was relying on tapes and transcripts, I was not able to probe further and ask additional questions of those people participating in public comment because they were not part of this study.

The next level of coding was focused coding where initial codes from documents and participant interviews were categorized by thematic of conceptual similarity (Saldaña, 2016). The most salient categories and subcategories of codes were developed from this method. Then axial coding was used as a transitional cycle between focused coding and theoretical coding, as it helped in understanding how categories and subcategories related to each other. The last level of coding was theoretical coding and done together with interview data. Theoretical coding functioned much like an umbrella to cover and account for themes formed through development of codes and subsequent categories (Saldaña, 2016). Themes resulting from this research included Environmental Justice and Community Engagement, both of which will be discussed in Chapters 4 and 5.

Data Collection and Analysis for Interviews

Data for this case study were also collected through participant interviews. I conducted semistructured interviews between December, 2019 and May, 2020, using an interview guide

that allowed for a more conversational style of data collection (Creswell & Poth, 2018). The interview guide can be found in Appendix A. Using an interview guide allowed for inquiries that were more open ended and produced information that I had not considered. As Bailey (2018) noted, the goal is to ask questions through the course of the interview that get to the information in which the researcher is interested. During a regular, unstructured conversation, that might not necessarily be the case. Although Bailey (2018) does not argue anything goes during these interviews, they did advocate for being flexible and allowing for wide-ranging conversation, which may result in fruitful information. In my case, having an interview guide ensured all participants were asked similar questions to understand the similarities or differences of each participant's experience with climate action planning. The open-ended nature of the questions also allowed for participants to offer up topics I had not considered.

I interviewed residents of the City of Imperial Beach who had been involved in the climate action planning process to varying degrees. I used convenience sampling (Merriam, 2002) to find eight people willing to participate in my research. I conducted two interviews with each person, with the first interview lasting approximately 45–90 minutes. The first interview was largely unstructured conversation guided by the interview guide, while the second interviews were more structured. This allowed me to develop a better initial understanding of how participants viewed the topic of climate change and the challenge facing the City of Imperial Beach.

Many participants were open about their experience and provided so much information in the initial interview I asked questions I had planned to save for the second interview. Based on the suggestion of Cohen and Crabtree (2006), I anticipated these questions would be more personal and, thus, more appropriate for the second interview. Interviews were recorded using

either Otter, a web-based voice recognition software, or Zoom. Both Otter and Zoom provide transcripts of conversations within an hour of completing them. After each interview was complete, I wrote down my initial reactions to the conversation while I waited for the transcript to process. Once the processed transcript was ready, I did a quick review and some very brief, initial coding while the interview was still fresh in my mind. Using in-vivo coding for these initial codes allowed me to use words and phrases from participants' own language as codes (Saldaña, 2016). This allowed me to honor and prioritize voices of participants.

The next day I listened to the transcript and read along with it to ensure it was correct. If any words had not transcribed correctly, I edited the transcript to match the recording. After reviewing and editing transcripts, I performed initial coding to break down data into discrete parts (Saldaña, 2016). This allowed me to identify similarities and differences in participants' experiences and compare them with codes generated during document analysis. The second interviews lasted 15–45 minutes and were more structured to ensure inclusion of questions developed from the first interview and to follow up on any outstanding questions based on what initial coding revealed. The second interviews were reviewed and coded in the same manner as the first interviews.

After I completed initial coding for both interviews, I began focused coding. Focused codes were useful in categorizing coded data that came from not only interview data but also codes generated during document analysis (Saldaña, 2016). Focused coding revealed the most frequent and salient categories in the data sets. Next, as noted previously in the document analysis section, I used axial coding to understand how the most salient categories and subcategories related to each other (Saldaña, 2016). By performing axial coding, I highlighted contexts, conditions, and interactions of the climate action planning process which served as a

transitional cycle between the initial coding process and theming of the data. This coding process was helpful in seeing interview data and document analysis data as parts of the same whole. Lastly, as mentioned previously, themes were generated from codes and categories revealed in the data analysis process. Themes that resulted from interview data and document analysis will be discussed in Chapters 4 and 5. The following section discusses the population of Imperial Beach and participants of this study.

Description of the City of Imperial Beach

Imperial Beach is a small city with a population just shy of 28,000 people. The city website and study participants via interviews both described it as a quaint little beach town and highlighted the pier and activities, such as the Friday night farmer's market and sandcastle building contest that happen there (City of Imperial Beach, n.d.). In recent years, Imperial Beach has started to shake the reputation participants referred to as seedy, and locals maintain it is a hidden gem.

As noted previously, the average household income is a modest $65,500 a year. Only 30% of homes in Imperial Beach are owner occupied, with nearly 70% of residents of Imperial Beach renting. Forty-three percent of the population surveyed in the last census of 2010 stated they had little to no high school and only 11% obtained a bachelor's degree. Just 30% of the population has access to a car, and the city has 10% of its residents living at or below the poverty line. In comparison, the county of San Diego as a whole has a mere 3% poverty rate and California's statewide number is only 4% (Employee Development Department, 2020). The poverty rate jumps to 30% when only those living on Seacoast Drive are counted. Seacoast Drive runs parallel to the ocean and hosts a mix of private residences and commercial properties. Many residents who live on Seacoast drive purchased their homes with the intention of retiring there.

Many are now seniors living on fixed incomes in homes that have lost (or are expected to lose) value and, as a result, will become difficult or impossible to insure according to study participants. It should be noted those living on Seacoast Drive are most vulnerable to impacts of climate change.

As findings in Chapter 4 illustrate, city residents have been vocal and engaged participants in the city climate action planning process. According to city staff, community residents are regular fixtures at council meetings and were so vocal about their dislike for the idea of managed retreat city officials removed it from their climate adaptation plan. Some citizens have vocalized they believe the city can engineer their way out of the impacts from SLR; whereas, others feel stranded and stuck because the homes they own are now in flood plains and they lack money for adaptive measures or cannot afford to move. Participants in this study were all local residents who have experienced climate change impacts and/or have engaged on some level with local government and/or community groups in an effort to discuss, plan for and/or prepare measures to adapt to climate change impacts they are currently experiencing or expect to experience. Understanding how these residents are coping with impacts of climate change provided insights other communities may be able to use in their own climate adaptation planning process.

Study Participants

Participants for this study were recruited through several channels. An invitation to learn more about the study was posted into two Imperial Beach Facebook groups. From those postings, one participant was recruited, who then connected me with two additional participants who had been involved in the climate action planning process. One of those connections agreed to

participate, who then connected me with another participant. Engaging participants via existing connections is an example of snowball sampling as discussed by Creswell and Poth (2018).

I also was able to obtain emails from all study participants using the sign in sheets that the city had attendees sign when they attended a meeting about climate action planning. Emails were available as a matter of public record in accordance with the Ralph M. Brown Act (1953). All participants were emailed an invitation to participate in the study and three participants contacted me as a result of email solicitation. The final way participants were recruited came via a cold call to the Imperial Beach city office. After discussing the study with city staff, two city staff members agreed to participate.

An effort was made to solicit participants who did not view the CAP process favorably or had not participated in the planning process at all. I had several discussions over email and Facebook Messenger with individuals who were either unaware or opposed to the CAP, but who responded to social media posts about this study. Unfortunately, those possible participants declined to engage with the study. The lack of dissenting viewpoints will be discussed in the study limitations section of Chapter 5.

In total, there were eight study participants recruited from the local community. As discussed in Chapter 1, the idea of community is complex and individuals belong to multiple communities. Each participant was a member of the broadly defined Imperial Beach community, but was also a member of additional communities nested within that larger community. A short biography of each participant is provided. Each participant is identified by a pseudonym.

- Leonard was in his mid-60s and has lived in Imperial Beach for nearly 12 years, prior to that he lived in Chula Vista, a neighboring town. He has surfed in Imperial Beach much of his life. He is involved in local politics, regularly attends city meetings, and was

appointed to a city board. His professional background was in construction, but he is now retired. He identified as male and White.

- Ashley was in her early 30s and worked for a local nonprofit engaged in climate action work. Not only did she follow what was happening in Imperial Beach from a climate policy perspective, but she also tracked the climate action planning of other cities in San Diego county. She identified as female and non-White.
- Ed was a civil engineer who has spent the last 25 years working in habitat restoration, focused primarily on wetland restoration. He has lived in Imperial Beach since 1963 and also currently serves on a city advisory board. When he was growing up, he spent time fishing in the Tijuana Estuary. He credited those experiences in nature with his environmentalist leanings today. He identifies as male.
- Nancy has been working for the City of Imperial Beach for almost 3 years. She was hired at the end of the climate action planning process, but had participated in many information gathering sessions and was well versed in the city's current and future plans. She identified as White and female.
- Mark was a retired city employee. He spent his career working in city planning. He became interested in water quality when he was living in the San Francisco area and noticed fish were dying because factories were releasing their chemicals into the local water supply. Mark became interested in climate change through a work assignment. He identified as male and Asian-American.
- Anna was a current elected official living and working in the city. Her background was in marine sciences. She moved to Imperial Beach during college because it had the best

waves and she loves to surf. She was born in San Francisco, to Mexican parents. She identified as female and Latina.

- Dave was a former state park ranger who works in habitat restoration. He has lived in Imperial Beach since the 1980s. He was in his late 60s and identified as male.
- Steve was a current city employee. He had a background in environmental science and spent a portion of his career mapping earthquake fault lines. In addition, he worked as a lifeguard in his youth and was an avid surfer. He was in his 40s, identified as male and White.

Data Collection and Analysis for Field Notes and Journaling

As recommended by Creswell and Poth (2018), I intended to keep field notes of my time in Imperial Beach and any interactions and experiences I had there; however, because of the COVID-19 pandemic, my time on site was cut short and gathering for meetings and socializing was not an option during the bulk of my data collection period. Conducting observations would have been relevant to this research, as in-person community engagement was part of the process of climate action planning.

Instead, I used journaling during the data collection process and those notes and thoughts were useful during the data analysis process. Journaling and note taking was an effort to capture emerging ideas and aid in the development of questions, but they also proved helpful in setting up initial codes when the process of coding my transcripts began. My journal entries provided reminders and captured initial thoughts that might have been lost otherwise. This process also helped me flag important quotes I wanted to be sure to include in the discussion of my research findings. I believe this helped to aid in my thorough understanding of the contents of my data, as advised by Creswell and Poth (2018).

Criteria for Interpreting Data

Developing criteria for interpreting data is also important. Unlike a quantitative study, there is not a marker that demonstrates statistical significance such as a p level being less than .05. One way to demonstrate significance is to think about rival theories that could explain your data and make an effort to address those (Yin, 2014). Triangulation of data can also be used to demonstrate significance if a finding is showing up in multiple data sources it is unlikely to be misleading and will help to create a clearer picture (Stake, 2006). Many findings were reiterated by multiple participants, echoed in city documents, and supported through news coverage of the climate action planning process. This was very helpful in understanding what issues were most important to community members.

Yin (2014) stated the criteria for inclusion of data in a study was that the data addressed the most significant aspect of the case. In this study, the key aspect was climate change, and all collected and included data tied back to that critical issue. Another guiding criterion for interpreting data was to ensure all evidence was attended to and research questions were exhaustively covered. Any evidence pertaining to the key question of climate action planning was included in this study. Additionally, this study sought to use all evidence available about the climate action planning process in an effort to ensure there were no loose ends in this research.

A critical piece of setting up criteria for interpreting data was to develop my initial codes with the aim to have no more than 30, as recommended by Yin (2014). Additionally, it was important to have all my data (i.e., interview transcripts, news articles, city documents, and journal entries) in one place, to ensure nothing was missed during analysis. As a result, all transcripts and documents were imported into NVivo. Using NVivo to code verbatim interview transcripts and documents I had collected allowed me to have all of my sources together in one

location regardless of the form in which data were collected. This also allowed me to see it holistically. This helped to ensure I was interpreting data, regardless of its original source, in the same way. Table 3 provides several examples for how data were coded and categorized to arrive at the eventual themes of this study.

Table 3

Coding Examples from Data Collection

Quotes	Codes	Categories	Themes
"We're a very tiny, tiny little city and for that many people to show up was amazing."	Show up	Community action	Engagement
"We had them fill out comment cards, we had them give testimony."	Public comment	Public participation	
"A lot of like locals coming out. It's just unusual. It was kind of thing."	Locals coming	Public participation	
"Because we're on the border, you know, so there's interesting issues researchers like to study so we let any researcher on to our beach, or whatever they want to down there."	Border issues	Research institutions	Collaboration
"I am part of this adaptation working group, through the climate collaborative and we have different members from different cities and we discuss what our individual groups are doing in regards to adaptation."	Adaptation	Regional working groups	
"The Energy Action collaborative group is a more focused regional body and then they had funding to be able to help local jurisdictions in the South Bay network to discuss what are jurisdictional needs."	Local networks	Regional working groups	

Quotes	Codes	Categories	Themes
"What they really care about is affordable housing and affordable housing near public transit is a key climate strategy."	Affordable housing	Social justice	
"They're the ones who are going to have the most difficulty when their property is damaged. How are they going to repair that or how will they be evacuated?"	Difficulty coping	Communities of concern	Environmental Justice
"The fact that the people who have contributed the least to the problem are going to suffer the most and are suffering the most through pollution… It ultimately becomes an issue of, like, what's right?"	Pollution	Communities of concern	
"The Mayor, a democrat, was kind of pushing for managed retreat and he got hammered for that. Now he's kind of changed his mind. And the reason is he changed his mind is political. He didn't all of a sudden decide he was against it."	Managed retreat	Political calculations	
"When I started becoming more involved in, in local politics, I found out that it is extremely polarized here and you know, perhaps exacerbated by the current administration in Washington."	Politically involved	Polarized	Political Polarization
"You have a small faction of individuals who politicized the issue or, or use it as an excuse to engage in racist rhetoric that's fueled maybe by our administration."	Politicized issues	Polarized	

Presenting the Data

This study is presented in an unsequenced structure, which assumes section sequences are not of particular importance (Yin, 2014). This structure was chosen because findings of this

study could be presented in any order and it would not alter its value. Though the order of sections does not matter, overall value of the collection is important and if one section were missing, the case study would not be complete. Even though this is a descriptive case study, if the description is not complete and inclusive of all sections, the version of the case would be skewed (Yin, 2014).

Case study also relies on the use of vignettes to set the context (Yin, 2014). Using rich, thick descriptions that allow the reader to feel as if they have been in Imperial Beach was the most effective way to present these data. As Stake (1995) noted, readers are drawn to unique stories, narratives, and experiential accounts. Therefore, prioritizing the voice of participants was important in creating a compelling case study. It was also important to publish these data in a written form that shares new knowledge created through this research.

As mentioned previously, there are many news stories about this community and the climate change impacts the city has been experiencing and expecting, but there has not been a study that looks at how the city and community engaged in a climate action planning process. If this research is going to have any impact outside of the academic community, communicating findings in a way accessible to a population wider than those who know how to find a dissertation in a library database is essential. As shown in Chapter 4, study participants wanted to have access to the research happening in their community and want it to be used to inform the climate action planning process. Ultimately, I hope to have this research published in nonacademic spaces so Imperial Beach citizens and other communities can find this information and use it.

Discussion of Research Ethics

The following sections address research ethics associated with case study methodology generally and this study specifically. Ethical research is essential to establishing trust, promoting accountability of the researcher, minimizing error, and avoiding harm.

Ethical Framework

Although there are ethical considerations every researcher needs to be aware of when conducting a study, ethical considerations are especially important when working with a population of which the researcher is not necessarily a member. It is important to think about how to address those challenges before arriving on site and conducting interviews. According to Creswell and Poth (2018), respect for persons, concern for welfare, and justice top the list of considerations. In terms of respect, it is important to ensure participant data are anonymized and kept confidential, and these processes, as they relate to this study, are detailed later in this chapter. For the researcher, concern for welfare refers to being considerate for how data are collected, especially if data collected are sensitive or emotionally charged, and in the case of this research question, perspectives and experiences shared were in some cases personal and quite specific, and, therefore, potentially could point to identities of individual participants.

In addition to protecting participants' identities, ideas on justice, fairness, and equity are also important to consider (Creswell & Poth, 2018). Ideas of justice, fairness, and equity were especially important for this study because some participants are part of a population that has often been marginalized by power structures of society and not often felt invited into the public planning process. Even though this population resides in a beach community in Southern California, it is not a wealthy community, and as a result of wealth disparity and lack of access to

financial resources, they have been disadvantaged in their fight to address, mitigate, and adapt to climate change.

Trust is also an important ethical consideration for data collection. Creswell and Poth (2014) placed a high priority on establishing trustworthiness and discussed a variety of ways to gain trust and establish trustworthiness. Because I was not a resident of Imperial Beach, understanding the community and finding "gatekeepers" who could help provide me with community contacts became important. Consequently, building trust with the community and study participants was an important part of this process. As Harrison et al. (2001) noted, reciprocity, or the give and take of social interaction, can be used to gain trust and access to a setting or group. Reciprocity and judicious use of self-disclosure of my personal background and interest in this area of study helped to build connections in the community and reduce the power differential between myself as the outside researcher and participants in this study. It is also possible to maintain trust through member checking and soliciting feedback from participants (Creswell & Poth, 2018). When participants related to the interpretations and found the analysis to be credible, this served to increase my trustworthiness.

From an ethical standpoint, prolonged engagement with participants and consistent observation in the field is encouraged because it allows the researcher to build rapport with participants and gain a better understanding of the cultural context in which they are working. As noted by Creswell and Poth (2018), prolonged engagement leads to a greater number of chances and a wider variety of opportunities to collaborate with participants. This engagement allows participants greater involvement in "developing data collection protocols and contributing to data analysis" (p. 262) and allows for participants to be as involved, or uninvolved, as they wish. Creswell and Poth (2018) also noted if written accounts do not resonate with the intended

audience trustworthiness is at risk. As a result, I shared my initial observations and research findings with participants to allow for member checking and to ensure I interpreted what they said correctly. Given the COVID-19 global pandemic occurred while I was in the middle of my data collection process, I was not able to spend as much time on site in the community as I wished, but as a result of technological tools like Zoom and Facetime, I was able to conduct my interviews and build relationships with my participants.

Institutional Review Board

I applied for and received expedited review for this study through Chapman University's Institutional Review Board (IRB) based on institutional requirements. According to the Chapman University IRB, selected categories for expedited review include: research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies (Chapman University, n.d.). Additionally, although I did collect voice and video recordings during the interview process, the research I conducted did not subject participants to more than minimal risk.

Researcher Positionality Statement

In qualitative research, the instrument is the researcher. As a result, it is important for a researcher to understand their own positionality and how it impacts not only the way their research question is framed, but also the way data are collected and how it is analyzed. All research questions come from somewhere, and it would be foolish for any researcher to believe they are able to embark on research and never address the space from which the question is coming (Creswell & Poth, 2018). It is also important to note I am interpreting results of this

study based on the framework presented previously. What you see in Chapter 4 is my interpretation of data collected through this study. The exploration of where this particular research question comes from was based on my own life experience and research interest.

I am not a forced migrant, a refugee, an alien (documented or otherwise), or a displaced person who has had to relocate as a result of a changing climate. Quite frankly, because of my fair complexion, access to education, and resulting affluence, I am unlikely ever to be part of a population forced to migrate. Like many people experiencing climate change impacts, however, I am from a place that is forgotten, discarded, and largely discounted.

I grew up in a small town in eastern Kentucky, in the foothills of the Appalachian Mountains, and you know it the minute I open my mouth because the mountains I grew up among are imprinted on my soul and roll off my tongue. I once had a doctoral classmate say to me, "You are smarter than you sound." Yet, I have never felt the need to pronounce words *nine* or *like* as one syllable or alter my accent in any way. I understand all too well when I open my mouth to speak, because of my accent, certain negative connotations or stereotypes may pop into the minds of listeners. But the mountains helped to form me, just as the beach helped to form residents of Imperial Beach.

Appalachia, like other places far removed from big cities and transportation hubs, is a place not well understood. Most of what people know about Appalachia comes from the movie *Deliverance*, or more recently, *Hillbilly Elegy*, and the shaky video and grainy photographs taken out the window of the motorcade following Lyndon B. Johnson as he rolled through my community on his way to announce his War on Poverty. Spoiler alert: the War on Poverty, much like the War on Drugs, did not work. It did, however, provide a great deal of fodder in the form

of videos and pictures that have been used to distort Appalachia and project it as a region of trash that can be exploited or trotted out for comic relief.

And exploit Appalachia they did—*they* being coal companies. Billions of dollars have been stripped from Appalachia leaving in the place of coal seams, polluted streams, former miners with no health care and crippling black lung, and devastating poverty that has made economic stimulus nearly impossible for the communities the coal barons left behind. This did not happen because mountain people are stupid. It happened because we are kind, care for each other, and naively thought the coal companies cared about us.

Eastern Kentucky is a physical representation of inner turmoil. It is beautiful, but not fancy. It is warm and welcoming, but isolated. It is suspicious of change, but in desperate need of something new to spur good outcomes. It is tied to an industry and a way of life that is not coming back. I was always trying to get out, and now it seems like I am always trying to get back home.

Imperial Beach is not much different. It is a sleepy beach town. You will not drive through it on your way somewhere else. If you are there, it is on purpose. In the coffee shop, the staff were very friendly, but it was clear from the ways they spoke to me I was not a regular. The ocean is beautiful, but if you are there on the wrong day, you cannot swim or play in the sand because of sewage spillage from Mexico. The Navy thought it would also be a good place to bury some nuclear waste below the water table, and not mark it very well.

Growing up in Appalachia in some ways seems like a foil to what it might be like growing up in Imperial Beach. In my hometown, Paintsville, you cannot go to town without seeing at least three people you know. Imperial Beach is not much different. During an interview with one participant, we paused for 10 minutes so he could catch up with his friends who

happened to walk by. As one participant noted, “I just go talk to the mayor about what I think. I usually run into him at least once a week when I go surfing. Everybody knows everybody here.”

I can relate to that. I lived that. If I talked in science class, my Dad knew it before I walked in the door because he had seen Mr. Burchett at the grocery. My mother frequently said, “If you can’t do it in front of your Mamaw and Mrs. Crumb, then I suggest you don’t do it at all, because they’ll both find out.” If I wanted to tell the mayor something, I would see him at church. He and his wife, who was also my third-grade teacher, sat three pews behind us.

Being from rural Appalachia, I have long joked the mountains are carved into my heart and, similarly, participants in this study were clearly shaped by growing up by the sea. Participants in this study all started paying attention to environmental issues when their own lives were impacted by polluted water or flooding. My entry into sustainability and climate action is not so different. My nursery school teacher, Ms. Jeanie, taught our class about litter, and I started to notice it everywhere I went, which opened a floodgate for me. I could not read enough about the Pacific garbage patch, the greenhouse effect, and global warming (what it was still called in 1990), how the Amazon was the lungs of the earth, and how coal kept the lights on, but it was at the expense of clean air and clean water.

These were not normal interests of a child in Appalachia, much less one whose grandfather owned a coal trucking business. But nevertheless, my parents bought me magazines about the Galapagos Islands and Amazon rainforest. My mom found a cassette tape that featured hits such as “What are we going to do with all that trash?” and I played the tape until it warped. I adopted dolphins and whales and started saving my allowance and birthday money to buy an acre of the rainforest. My dad helped me build a solar oven, and I even managed to cook a few hotdogs on it before the neighbor’s dog discovered it. I wrote letters to my state and federal

representatives about the need to take action to limit CO_2. At my instance, my parents had reusable grocery bags 30 years before it was trendy, and never once complained.

On a beach vacation, I encountered a group who had collected a pile of seashells. I asked them what they were going to do with the shells because they still had the creature in them. One of the guys said, “We’ll just drop them into boiling water and the conch will come right out.” When I asked if they were making conch soup and he said, “No.” I gave them such an earful my parents had to drag me away. But when we walked back by, they were putting the seashells back in the ocean.

In college, I got to take my first proper environmental science class. In my philosophy classes, I was learning about environmental justice, and in literature courses I was reading U.S. writings about nature that helped me understand better my own relationship with the natural world I spent most of my childhood in. I was relentless in my pursuit to talk to people about why a changing climate was a problem and how protecting the planet was a matter of our survival. Most of my friends humored me. My best friends asked questions. But nothing really changed.

I didn’t see solar panels, electric cars, or even recycling bins in most places.

Nothing was happening. Nothing was changing.

And I knew in my bones time was running out.

When I showed up at Duquesne University, it was clear I was the person most passionate about sustainability, in a sustainability graduate program. And that was okay. I might have been the most, but at least I was not the only anymore.

As a master’s in business administration in sustainability student, I learned how to make the business case for environmentally preferable decisions. I learned change management theory.

I figured out how to account for greenhouse gas emissions and to put those numbers into something other people could understand. But, it still was not enough.

Even in my job as energy and sustainability manager, it is still not enough.

We are not doing enough.

I need to know how we, as human beings on this little blue marble, move climate action forward in ways that protect people, communities, histories, and cultures from a wave that will eventually swallow us all.

Unlike some residents in Imperial Beach, I am not grappling with how long I can remain in a home intended for retirement. I do not have to figure out how to access my house when roads are flooded because of a king tide. I have never been forced to live upstairs while I wait for water to recede from the first floor of my house or leave my home quickly with the risk of not knowing when I can come back. But I have made the decision to build a life away from where I grew up. And though I have not been a forced migrant, I have been a migrant. I know what it is to learn a new town, a new community, even a new language, and to adapt to a different culture. I know what it is like to grapple with the question of moving to avail myself of better opportunities. There is one crucial difference for me: I can always go home if I want, which is unlikely to be the story of some residents in Imperial Beach. Many will be forced to leave their home as the king tides become more frequent and the sea level continues to creep closer. Returning will not be an option. The earth is warming, and predictions of the future are now realities of the present. The City of Imperial Beach is living with and struggling to adapt to a swiftly changing climate. When SLRs 6 feet, it is not just a number for the people of Imperial Beach. Six feet of SLR washes away home and histories.

Reiteration of Significance of Study

This study is significant because Imperial Beach is not the only population dealing with climate change impacts and trying to figure out how to adapt to their changing landscape. There are currently 19 communities in the United States asking questions about how long they can remain in their homes because adaptation and mitigation are simply not possible (Wennersten & Robbins, 2017). An untold number of coastal communities throughout the United States are working on drafting climate action plans of their own and seeking guidance on how to draft them. Having a case study that may have transferable learnings for those communities facing similar struggles may prove to be very valuable. Governments and NGOs working on addressing the challenge of climate migration through policy changes and support networks, may also be able to use these learnings and shape better programs. This study is necessary and important because lives are being impacted by a changing climate and communities, and individuals are facing what may appear to be them, impossible choices. Understanding how one community grappled with climate action planning may be useful for other communities going forward. The following chapter will discuss the findings of this study.

As noted previously, generalizations cannot be drawn from case studies, but the learnings can be transferable, especially for other studies coming from the same theoretical background (Stake, 1995). It was my responsibility as the researcher to use thick descriptions so readers can make informed decisions about transferability of the findings to specific contexts in which they are working (Lincoln & Guba, 1985). Using necessary details to link conclusions to raw data and context allows for alternative conclusions to be considered by the reader and provides another way for the reader to determine transferability (Houghton et al., 2013).

CHAPTER 4: FINDINGS

Chapter 4 addresses the findings of this case study. The goal of any case study is to understand and appreciate the uniqueness and complexity of the embeddedness of the case and how it interacts with the context in which it is occurring (Stake, 1995). This case study of Imperial Beach is no different and, as described in detail in Chapter 3, drew from participant interviews, document analysis, field notes, and journaling to understand the complex context in which the city was working to develop a climate action plan. All data collected were coded and through this process, categories of understanding and overarching themes emerged contributed to an understanding of the process of how Imperial Beach developed a climate action plan.

Using the case study method for this research was important because it created a history of the planning process, which did not exist prior to the study (Yin, 2014). It composed a document that illustrated factors crucial to the planning process and development of the climate action plan (CAP) in Imperial Beach. It shed light on nuanced ways local context, city efforts, and individual views interact with the process of developing a CAP. And, it has also contributed to a more in-depth understanding of practical ways communities attempt to cope with and adapt to climate change. For Imperial Beach, this case study has illuminated pragmatic realities that can provide insight as the city moves forward with future climate action planning.

Coping Looks a Lot Like Planning: Getting to a CAP

Imperial Beach's process to develop a CAP was explored in this study. Findings from this study were drawn from participant interviews, document analysis, field notes, a research journal, and member checking. These pieces were woven together to illustrate a cohesive picture of the process that led the city to the final version of the 2019 CAP. Data collected in this study is presented in two parts. Part I is a chronological time-series that attempts to capture all events

essential to drafting the CAP and any events that raised the subject of climate change and its impacts generally in the broader city consciousness.

Part II uses phrases from the interviews and documents analyzed to demonstrate the context and themes that run throughout this research and were critical to the process of Imperial Beach developing their CAP, local coastal program (LCP), and general plan (GP) consecutively in an effort to address climate action planning holistically. Part II also presents participant perspectives to reveal the process that led Imperial Beach to pass a CAP that one participant viewed as "the most aggressive plan in the state of California." Key categories and themes derived from participant interviews and document analysis are connected to key parts of the process. Connecting key categories and themes to the process illustrates what participants viewed as most helpful, and harmful, to the climate action planning process as a whole. A greater understanding around the process of developing a CAP illustrated areas of strength and challenges other communities may learn from as they embark on their own climate action and adaptation planning process.

Part I: History of Climate Action Planning in Imperial Beach

The following is a brief history of the city as it relates to environmentalism, climate change, and climate action planning. As illustrated by study participants in Part II of this section, the city has long had a strong environmental base, dating back to the founding of the city. Mark, a longtime resident of Imperial Beach, and former city employee commented, "We have a very strong environmental base here. Conservation was very important to the founders of the city, and to the folks that stayed in this community. So that leads naturally to being concerned about climate change."

It became clear as participants spoke about the climate action planning process Imperial Beach has been no stranger to innovative thinking and progressive action. From documents that revealed the use of an electric trolley to transport people around town shortly after the invention of electricity and the attempt to generate power from tidal energy with the Edward's Wave Generator in the early days of the city (Miller, 2004), Imperial Beach has a history of trying to meet its residents' needs in creative, sustainable ways.

As discussed in the introduction of this study, Imperial Beach is surrounded by water on three sides, with 87% of the city located in what the state of California refers to as the coastal zone (California Public Law, n.d.). As a result, Imperial Beach has been addressing coastal climate impacts, including sea level rise (SLR) and flooding, through the LCP of the California Coastal Commission since its inception in 1976. The coastal zone refers to land and water areas in California stretching from the Oregon border to Mexico (California Public Law, n.d.). It extends into the sea approximately 3 miles offshore, including all offshore islands, and extends inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas, it extends inland to the first major ridgeline paralleling the coast or 5 miles from the mean high tide line of the ocean, whichever is less, and in developed urban areas, the zone generally extends inland less than 1,000 yards (California Public Law, n.d.). The map in Appendix B shows the coastal zone in Imperial Beach and Appendix C shows a map of projected SLR in Imperial Beach.

In 2011, according to comments from participants familiar with the program, Imperial Beach joined with neighboring coastal communities to form the San Diego Regional Climate Collaborative in an effort to address climate change impacts from a regional perspective. As described by study participants and confirmed via document analysis, Imperial Beach has

worked over the last 8 to 10 years to understand what climate change impacts the city could expect to experience not only as part of the San Diego region, but as a city. Through this process, Imperial Beach developed their CAP. This plan, as revealed by findings of this study, is the result of years of work by the city, its residents, and subject matter experts to understand what the city is facing, what adaptation measures are possible and palatable to the community, and which provide the best long-term outcomes and coping strategies for the city.

Imperial Beach Climate Action Planning Timeline

To understand the history of climate action planning in Imperial Beach and how the city arrived at what Anna, a study participant, described as "the most aggressive climate action plan in California," at the time it was drafted, it is important to understand events that made this climate action planning possible. It became clear, through document analysis and interview data, community members placed a great importance on formal, participatory events that occurred during this process. Following is a chronological time-series of events in the City of Imperial Beach that were critical to developing community support for development and approval of the CAP, LCP, and GP. These three plans work in tandem to address climate impacts the city is currently experiencing and expects to experience. Developing a chronological time-series of actual events of the case study is an effort to understand if these events were the basis for causal inferences participants discussed in their interviews (Yin, 2014). The following time-series analysis is an essential element of this case study because it seeks to identify what events were key components of the climate action planning process and how they supported community engagement.

When reviewing this chronological time-series, it should be noted the climate action planning process started 14 years before the plan was finalized. The city conducted an

ecotourism study in 2005, which was the first documented discussion at a city level about prioritizing local coastal environmental attributes and ecosystem services (City of Imperial Beach, n.d.). There is a 6-year gap between the ecotourism study and the first climate action planning efforts, as documented by the city joining the San Diego Regional Climate Collaborative in 2011 and noted in participant interviews. It became clear from reviewing documents and speaking with study participants there was one event each year between 2011 and 2015 they considered important events for the CAP process in Imperial Beach.

The events in 2011 and 2012 were regional in scope and hosted through the Regional Climate Collaborative. When participants spoke about regional engagement, they noted regional action as an important first step. When the city began hosting their own events about climate change impacts, notably the Water Commission's Citizen Forum in May 2013, the priority for participants became the effects in Imperial Beach. This event was focused on using the Tijuana River Valley to increase resiliency to climate change impacts and how local agencies based in the surrounding cities were supporting that work. This was the first evidence of a public-facing educational event in which Imperial Beach hosted. This event seemed to be a landmark event for encouraging the city in June of 2014 to embark on their own SLR study. Once the city started to gather their own data, participants noted and the timeline illustrated, the pace of climate action planning began to accelerate.

In 2015, as noted in documents accessed from the city, a steering committee was set up to guide the SLR study. The city also began to provide more education to the community about climate change and SLR impacts in Imperial Beach through city-hosted workshops and city documents shared online. Participants discussed the steering committee as a key component of the CAP process. Participants viewed workshops that brought different stakeholders together as

most valuable. In 2016, the timeline illustrated the city continued to use the steering committee to vet mitigation strategies and hosted two more workshops focused on SLR, climate change, and adaptation and mitigation efforts. This finding was confirmed through participant comments as well. Document analysis also revealed, at this point in the timeline, the city was increasing the frequency of CAP planning events year over year and it started to become evident certain events were precursors to success of future climate action planning events.

In 2017, as learned from city documents and noted in the time-series, the city was awarded grant funding for climate planning and released the first draft of the LCP and GP for public comment. Based on interviews, study participants viewed grant funding as an important component of the CAP process in Imperial Beach. Participants continually referenced the lack of dedicated city budget funds available for climate action in the city. In 2018, the year prior to release of the final draft of the CAP, LCP, and GP, the city council documents revealed the city hosted more public events and workshops and even released a survey to solicit more community engagement. This was also the year the managed retreat entered local lexicon, according to participants. This finding was confirmed by the fact the city hosted a discussion about the topic and documented it on the website. When participants discussed the idea of managed retreat in interviews, it was clear this was an issue that caused frustration for everyone, and participants nearly universally agreed the city did not facilitate the discussion well. The city actually removed the term “managed retreat” from the final draft of the CAP.

The time-series concluded with publication and approval of the CAP, LCP, and GP. Prior to the passing of these three plans, the city continued to host community workshops, stakeholder meetings, and drop-in sessions at City Hall in an effort to garner public support for and feedback on the plans, as noted in city council meeting minutes and communication provided by the city.

Ultimately, the chronological time-series showed the city had increased communication and events around the climate action planning process every year and helped to corroborate participants' experiences. Chapter 5 discusses the importance of the sequence of these events, and how time periods in this study are marked by classes of events that occurred at certain intervals.

One final note on the chronological time-series is it aims to lay out the formal steps the city took to educate the community and solicit feedback on the CAP, LCP, and GP. There are informal actions taken by individuals and groups that were not documented as part of city public record but were referenced in interviews. Getting definitive time stamps on many of those informal actions and experiences was difficult and as a result they are not included in the timeline in Table 4. Those events and experiences were captured in the interview process and are discussed in Part II in the categories and themes.

Table 4

Chronological Time Series of Climate Action Planning in Imperial Beach

Date	Event	Description / Notes
2005	Urban Waterfront and Ecotourism Study	The Urban Waterfront and Ecotourism Study found the city should be focused on accommodating visitors who patronize local coastal environmental attributes such as the Tijuana Estuary.
2011	San Diego Regional Climate Collaborative Established	The collaborative was established in 2011 as a network for public agencies to advance climate change solutions to mitigate greenhouse gas emissions and adapt to effects of climate change. Partnering with academia, nonprofit organizations, and business and community leaders, the collaborative strove to raise the profile of regional leadership, shared expertise, and leveraged resources. The mission of the organization is to connect the region to advance climate change solutions.

Date	Event	Description / Notes
Jan. 2012	First Regional Sea Level Rise Study was done	In 2012, The San Diego Foundation provided $122,000 for development of the SLR Adaptation Strategy for San Diego Bay. Through this project, Imperial Beach joined with Coronado, National City, Chula Vista, San Diego, The San Diego Airport Authority and the San Diego Port District to discuss how to adapt to coast flooding in the region.
May 23, 2013	United States Section of the International Boundary and Water Commission (USIBWC) Citizen's Forum	The purpose of the citizens forum was to promote exchange of information between the USIBWC and the community of Imperial Beach about commission projects and related activities. Danielle Boudreau, coastal training program associate at the Tijuana River National Estuarine Research Reserve (TRNERR), gave a presentation about the Climate Understanding and Resilience in the River Valley (CURRV) project. The project seeks to increase the resilience of the Tijuana River Valley against impacts associated with regional climate change by conducting a vulnerability assessment to inform development of a climate adaptation strategy. The presentation focused on how TRNERR has been helping local public agencies, including the City of Imperial Beach, collaborate through the CURRV project to improve the River Valley's ability to adapt to flooding and inundation caused by SLR and shifting precipitation patterns altering watershed inputs into the Tijuana River.
June 1, 2014	Request for Proposals for Sea Level Rise Study	The city put out a call for consultants to conduct a Sea Level Rise Study.
Mar. 15, 2015	Steering Committee Outreach	The city requested local leaders to volunteer for the SLR steering committee via the Imperial Beach Newsletter. The role of the steering committee was to provide first-hand knowledge, help identify future vulnerabilities and adaptation strategies, offer insight on engaging the public, and ensure the project aligns with the current and future community vision.
Mar. 24, 2015	SLR Steering Committee Meeting 1	At this initial meeting, the steering committee was introduced to the project scope and forthcoming scientific information. They identified existing conditions, mapped current known nuisance flooding locations and identified sectors to analyze in the vulnerability assessment.

Date	Event	Description / Notes
July 2015	Climate Ready Grant Received	The city received a $300,000 Climate Ready grant from the State Coastal Conservancy (SCC) to develop the sea level rise study for the city. The Sea Level Rise Study, performed by outside consultants, Revel Coastal, addressed impacts of SLR and assessed the effectiveness of various shoreline protection strategies. This study concluded in 2016.
	San Diego Foundation Awards Additional SLR Grant	The city also received a $70,000 grant from the San Diego Foundation to address gaps in the Sea Level Rise Study. This grant included enhanced public outreach, an update to the shoreline inventory, and economic analysis of SLR vulnerabilities and of adaptive strategies to be considered. This grant concluded in 2017.
Nov. 2015	Imperial Beach Newsletter	The November newsletter was dedicated to the Sea Level Rise Study and El Nino Preparation. It also included an invitation to the workshop held on the 17th.
Nov. 17, 2015	Joint City Council / Design Review Board / Tidelands Advisory Committee/ Stakeholders Workshop	At this workshop held at the TRNERR visitor center and attended by approximately 350 residents from Imperial Beach and local stakeholders. Information was presented on El Nino and SLR by the consultant team and multiple city agencies.
Jan. 27, 2016	Steering Committee Meeting 2	The consultant team from Revel Coastal briefed the steering committee on initial coastal storm modeling results for the 100-year storm under 0, 0.5, 1.0, 1.5 and 2.0 meters of SLR and scientific information available from the Department of Defense on similar SLR and coastal flooding for naval assets in the region (USC Sea Grant, 2020). It was decided the city would use both sets of information to assess its vulnerability through a spatial aggregation analysis. Following a primer on the suite of different adaptation strategies available to coastal communities in planning for SLR, the steering committee was tasked with recommending their top five adaptation strategies for consideration in the forthcoming economic analysis. The steering committee was given a PowerPoint outlining possible strategies and challenges, and a matrix of adaptation strategies that provided information on technical details, spatial scale, adaptive capacity, and costs.

Date	Event	Description / Notes
Mar. 1, 2016	Steering Committee Meeting 3	During this steering committee meeting, the near-final coastal flooding and erosion vulnerability assessment results were reviewed. The workshop focused on identifying five adaptation strategies to include in the economic analysis to be conducted by Dr. Phil King. The chosen strategies were: • Hardening and armoring of the entire Imperial Beach coastline • Business-as-usual sand nourishment • Dynamic revetment and dune development • Extension of the north groin w/associated sand nourishment • Managed retreat hybrid option that includes fee simple acquisition of coastal properties with lease back option for current property owners
Apr. 12, 2016	Steering Committee Meeting	The city received an update on the economic analysis, and an outline of the Sea Level Rise Study report that was then released in June 2016.
May 11, 2016	Joint City Council / Design Review Board / Tidelands Advisory Committee/ Climate Ready Stakeholders Workshop	This meeting covered the background of the project, regional efforts to adapt to climate change, the Sea Level Rise Study, general coastal hazards, a vulnerability assessment, adaptation strategies, future work, and a community discussion. The discussion was guided by three questions: 1. What do you value about Imperial Beach today and want to see maintained in the future? 2. What adaptation strategies align with your view of your community? 3. How should we pay for adaptation to coastal flooding and erosion? 4. How should we communicate these findings to the community? Notices for this meeting were in the Imperial Beach Newsletter and the local paper.
May 18, 2016	Applied for Coastal Commission Grant	The city applied for a $300,000 grant from the California Coastal Commission that would allow them to incorporate the Imperial Beach Sea Level Rise study recommendations and the mitigation component of a CAP into an amendment to the Imperial Beach LCP.

Date	Event	Description / Notes
June 2016	City of Imperial Beach Sea Level Rise Study Released	The goal of this study and subsequent report is to help the city identify and use the best available scientific information to assess the city's vulnerability to SLR and coastal storms, and to guide the city in identifying appropriate adaptation strategies.
June 15, 2016	SLR Vulnerability and Adaptation Workshop	The community was provided with an overview of the SLR report from Revel Coastal, results of the vulnerability assessment, possible adaptation strategies, and future work needed.
Jan. 23, 2017	Coastal Commission Grant Awarded	The City of Imperial Beach was awarded $225,000 from the Coastal Commission (this was in response to $300,000 the city applied for) to concurrently update the LCP and GP of the city. The grant specified the project would include analysis of the portion of the city located in the coastal zone and the development of policies related to SLR, climate change, water quality protection, sensitive habitats and natural resource protection, and energy and industrial development standards. It also stated community outreach designed to specifically engage Imperial Beach's demographics would occur as part of the project. This grant was given specifically to help the city reflect new information and changed conditions in light of climate change. The grant was funded from January 2017 to December 2018.
July 20, 2017	Imperial Beach Local Coastal Program Issue Analysis Report	In July, the LPC Issue Analysis Report was released to the city. This report looked at existing gaps in the current LCP and GP, with a special focus on where the plan needed to address climate change and coast hazards to be in compliance with the Coastal Commission's guidelines (Bragado, 2017).
July 28, 2017	Steering Committee Meeting	The city was not able to provide any documentation that detailed items discussed in this meeting.
Fall 2017	Draft of LCP/GP are Released for Public Comment	A draft of the LCP/GP was released for discussion purposes only. Its purpose was to gain early public input on the draft policies being considered as part of the focused plan update. The goal of this report was to aid in retaining the small beach-oriented town feel Imperial Beach is known for, while increasing climate resilience, sustainability, equity, health, and economic prosperity.

Date	Event	Description / Notes
Sept. 19, 2017	Steering Committee and Stakeholder Meeting 1	The city was not able to provide any documentation that detailed items discussed in this meeting.
Dec. 13, 2017	Steering Committee Meeting	The city was not able to provide any documentation that detailed items discussed in this meeting.
Jan. 11, 2018	Public Workshop 1 on the Update to the LCP/GP	This public meeting included an overview of the GP, LCP, and CAP. Public comment was solicited at this time in both spoken and written form.
Feb. 14, 2018	Joint Study Session 1	The goal of this session was to set an overall community vision to achieve a healthy environment and strong economy, improve resiliency to SLR, update the GP and LCP, and adopt a CAP.
Feb. 14 – Apr. 11, 2018	Resilient Imperial Beach Community Survey Released	The city residents were asked to take a survey about what climate action planning they were interested in the city doing.
Feb. 28, 2018	Imperial Beach LCP/GP Update	They received an update on the LCP/GP progress from the consultants helping them draft their plan. Challenges and issues were outlined, followed by possible solutions and benefits associated with each solution in an effort to help the city determine which actions they would like the plan to include. This update also expressly stated the CAP and LCP/GP would be written so they tied together easily.
May 2018	Resilient Imperial Beach Survey 1 Results Were Released	The city received 335 responses to eight questions. Environmental and water quality were selected as the most important challenge facing the city. The most popular approach to shoreline protection was on a case-by-case basis.
June 20, 2018	Steering Committee Meeting 6	The city was not able to provide any documentation that detailed items discussed in this meeting.
Sept. 21, 2018	Stakeholder Meeting 2 / Steering Committee Meeting / Public Workshop 1	This meeting focused on SLR adaptation strategies, the GP vision, the CAP, and key proposed measures.
Sept. 26 – Nov. 18, 2018	Survey 2 Was Released	This survey was focused on understanding what measures being considered for inclusion in the CAP residents favored the most.
Nov. 14, 2018	Joint Session 2	This joint session focused on the CAP, GP, and LCP and included the City Council, Design Review Board, Tidelands Advisory Committee, and the Parks and Recreation Committee. It was open to residents and other interested parties.

Date	Event	Description / Notes
Nov. 26, 2018	Managed Retreat Discussion	The management team of the City of Imperial Beach held a less formal oriented gathering to talk about managed retreat at the Dempsey Holder Safety Center. Residents were invited to attend, and to share thoughts and ideas about these issues.
Mar. 25, 2019	Draft Documents of the CAP, LCP, and GP Were Released for Public Comment	The city originally planned to vote on all these plans at the June meeting. Because of extensive comments these documents received during the public comment period, the city elected to separate out the CAP and the mobility element and consider them in a separate meeting in July. The LCP and GP would be addressed after meeting with the Coastal Commission.
Apr. 24, 2019	Community Workshop	Sixteen people attended the community workshop hosted by the city and the consultant AECOM to discuss the CAP, LCP, and GP. Four comment cards were collected, and nine letters were received and placed into city record.
May 13, 2019	Tidelands Advisory Committee Meeting	Comments on the draft documents were solicited from the Tidelands Advisory Committee.
May 15, 2019	Deadline for the Submittal of Public Comment on the CAP, LCP, and GP	Conclusion of the 45-day public comment period on the CAP, LCP, and GP. All public comments on the plans were due to the city by 5 p.m.
May 16, 2019	Design Review Board Meeting	Comments on draft documents were solicited from the Design Review Board.
May 20, 2019	Parks and Recreation Committee Meeting	Comments on draft documents were solicited from the Parks and Recreation Committee.
June 18, 2019	LCP and GP Drop-In Series Began	The city hosted drop-in hours for city residents to come to City Hall and ask any questions or provide any feedback about the LCP and GP. Sessions were held on June 18th and 19th from 4:00–5:00 p.m., on June 26th and 27th, July 9th, 10th, 18th, and 19th from 5:00–6:00 p.m.

Date	Event	Description / Notes
July 17, 2019	Climate Action Plan for the City of Imperial Beach Was Approved	The CAP was officially approved to provide a strategic framework for the city to measure and reduce greenhouse gas emissions. It also included an inventory of existing emissions and sets targets for reducing those emissions and prioritizes mitigation measure to help achieve city targets. The city also passed the mobility element of the GP, which called for moving people and goods in a sustainable manner. Because of extensive comments on the LCP/GP, the city did not consider that document at this meeting, electing to address issues brought up by community members with the Coastal Commission to resolve them before the plan was voted on.
Sept. 30, 2019	Final Draft of the LCP/GP Was Approved	The city released the final draft of the LCP/GP and the Land Use Plan/Implementation tracking spreadsheet.

Part II: Elements of Climate Action Planning

Part II uses phrases from participant interviews and documents analyzed to develop categories and themes to help understand the context and process of climate action planning in Imperial Beach. Categories and themes illuminated the context in which the city developed their plans. Unlike the timeline presented in Table 4, this section is not chronological, but instead pulls categories together to create themes that drove the process of climate action planning in the City of Imperial Beach. As noted in Chapter 3, this research was grounded in pragmatic inquiry and design theory. Resulting themes were woven from participant experiences supported by document analysis of things that worked, and did not, in the climate action planning process in Imperial Beach. Understanding the climate action planning process in Imperial Beach is an effort to illustrate how other communities might use this knowledge in their own planning processes.

Community Engagement: Finding Common Ground

When participants spoke about the CAP process in Imperial Beach, they commented it had been informed by local residents, subject matter experts, and city staff and council members.

As illustrated in the preceding time-series and confirmed through participant interviews, this was not a quick process, and required years of work by the city and engagement by residents, businesses, research institutions, and nonprofits in and near the City of Imperial Beach. Interviews in this case revealed how Imperial Beach capitalized on existing community norms, particularly around community engagement, to leverage resources and structures that aided in the climate action planning process ultimately leading to a plan supported by the community at large. Interview comments were supported by findings from the document analysis, particularly public comments and meetings minutes. By looking at what study participants viewed as successful community engagement tactics employed by the city and then exploring challenges faced in Imperial Beach during the climate action planning process, other cities may find some useful strategies and tactics to deploy in their own CAP process.

Meeting People Where They Are: Successes in Community Engagement

When study participants were asked about climate action planning, they universally commented on engagement from the community. It was evident from participant comments in this study Imperial Beach as a community has had a history of engaging with local initiatives and has been attuned to the public process of city government. This theme ran not only through the interviews, but was evident in the document analysis as well. One article about Imperial Beach's CAP harkened back to how the Tijuana Estuary was saved from being drained and turned into a yacht club in the 1970s by two local activists, Patricia and Mike McCoy, who still reside in the community (Guidi, 2018). This finding was confirmed by study participants, who generally commented community members took an active role in city initiatives via the public planning process and showed up to events like workshops and planning meetings. These data were triangulated through reviewing city documents that contained sign-in sheets from city

workshops, letters written to the council about the CAP, and comment cards from city meetings. Nancy, a city employee and study participant said, “In general, we have a very active and engaged community that is really informed and on top of being a part of the public process.” Nancy also noted, “We have individual members of our community that show up to city council meetings consistently and make an effort to look at how projects will impact the neighborhood.”

Steve, a long-time city resident and city employee echoed Nancy’s comment about there being a lot of engagement but also added, “the engagement is really happening on the advocacy side,” and prior to CAP discussions, most attendees were described as “the usual faces.” Ashley, a local community member who worked for a nonprofit focused on climate change mitigation echoed this sentiment and noted when it came to the LCP and the CAP meetings more people “showed up” than she was accustomed to seeing at City Council meetings. Ashley noted, “A lot of locals were coming out. It’s just unusual [to see that kind of turnout]. It was kind of a thing. People were getting angry and yelling.” Ashley attributed the passion that flared between community members to divisiveness of the idea of managed retreat, which some community members actively opposed. The idea of managed retreat is explored in an upcoming section.

The steering committee met regularly as illustrated in the time-series in Table 4 and confirmed from reviewing city documents. The steering committee was viewed as a critical piece of the climate action planning process by many study participants. When the city employees spoke about the steering committee, they placed a great deal of value on that group. Participants who were employed by the city noted the city hoped having a committee composed of technical experts, community members, and city staff to vet adaptation strategies would prevent community discussions from becoming too contentious. Steve, a city employee noted the reason the city set up a steering committee was “to hopefully avoid some of these contentious

community moments," participants referenced in interviews. Steve said by having a group discuss challenges and coping strategies available to the city before they were presented to the community, they could hopefully foresee issues that might come up during discussions and have a way to address them ahead of time.

In reviewing minutes from a presentation that the steering committee did for the City Council, Tidelands Advisory Board, and Design Review Board that was open to the public, it was evident community members present were coming from a variety of different perspectives. Based on the meeting minutes, Mr. Billbray had a firm grasp on issues associated with SLR and what that meant for the city; whereas, Mr. Hill and Mr. Creagan argued over whether there was too much sand or not enough sand on the beach and needed the exponential curve of the acceleration of SLR explained to them (City of Imperial Beach, 2016). These data showed there was a wide spectrum of understanding of climate change and what it meant for the city, even among the engaged population.

It should be noted although none of the participants enjoyed a city council meeting or community workshop characterized by yelling and anger, they did see value in many different viewpoints being expressed during these meetings. When participants spoke about these more contentious meetings, they appreciated a diversity of viewpoints and believed it contributed to a stronger LCP, GP, and CAP the community supported. This research showed participants believed even moments of discord seemed to have led to a better final outcome for the City of Imperial Beach.

Effective Mechanisms for Gaining Feedback. When participants spoke about different mechanisms the city used for gaining feedback on their draft plans, they valued having different ways to participate. Participants said the city gathered feedback at city council meetings,

community meetings and workshops, by tabling at the farmer's market and at community events, as well as receiving written comments in the form of letters, emails, and comment cards. This was confirmed through document analysis of publicly available sources retrieved from the city website or emailed to me by the city clerk. It was also common for study participants and community members to reach out to council members personally to share their views either via email, letter, or in person. The city also distributed a general CAP survey that had 350 respondents and a second survey about specific climate action measures that could be implemented. From the perspective of participants, some of these mechanisms were more effective than others. These mechanisms are discussed next.

Public Comment. Interview data revealed participants felt public comment was the most effective way to engage with the draft plans and provide feedback to the city. Nancy, Mark, and Steve all noted specifically community forums were a popular way for community members to provide feedback and from their perspective, the most effective. As Mark stated, when talking about community forums:

> We had them fill out comment cards. We had them give testimony. We had joint sessions, where we had the City Council, the Design Review Board, Tidelands Advisory Committee, and the parks and recreation committee. All of those four groups were seated at the workshop facing each other, along with all of the citizens, and so, they all heard citizens speak. And we encouraged the citizens not only to speak, but to send in their comments via our website. And so those are the ways in which we got and gathered community input. And I think that was fairly effective.

Interviews showed part of what made these sessions effective in the minds of participants was many city departments, which would be responsible for drafting and executing the plan,

were present and could hear local citizens' concerns, desires, and questions firsthand. Joint meetings were important because these councils and committees are each responsible for drafting different pieces of the planning documents. If they are not all receiving the same information their recommended plans may be contradictory to each other and cause issues later for the city.

Anna and Mark both said input from community members directly to council in meetings and in forums was some of the best ways the city had gathered feedback. Anna noted some city residents who are paying attention to what is happening in their city or want to know more are not always able to participate in the conversation because of how and when community forums or City Council meetings happen. City Council meetings are held twice a month, on Wednesdays at 6:00 p.m. For some people, getting to City Hall chambers by 6:00 p.m. is not possible because of work schedules, school commitment, or childcare needs. Because of these factors, Anna felt it was important to have a variety of ways to solicit feedback on city plans. As she noted, "We are a working-class community, so a lot of folks have work or other commitments," which effectively means their views might not get captured if other mechanisms for gathering information, aside from in-person public comment, did not exist.

When asked about her participation in soliciting feedback, Anna commented, "I've kind of taken a backseat when it comes to that outreach because I want people to share their honest and genuine opinions. And I feel like sometimes they can do that with staff rather than elected officials." It is important to note, as a public figure, Anna did not want her presence to affect responses of constituents or cause them not to share how they truly felt about issues. Anna recognized in the city her position as an elected official may cause others to perceive she had more power than her constituents. Through this research it was evident she believed some

residents would not be comfortable contradicting her or would naturally defer to her perspective and might not share how they really viewed issues if she were to attend all workshops.

When asked how in-person meetings were marketed, Nancy noted meetings were marketed to the community using techniques like electronic signage placed on the street, written notices in the community paper, paper notices posted in town shops and restaurants, and digital notices posted on the city website and Facebook. These data were triangulated with documents collected from the city website that advertised workshops and via links to Facebook posts. The time-series in Table 4 also confirmed these events happened when they were planned. Nancy did note even when informational booths were set up at places like the local farmer's market, the level of engagement from foot traffic was minimal. She noted when city staff set up a table at the farmer's market or in a similar setting, it was more of a time to provide information rather than collect it. In interviews, Nancy and Mark both noted the level of city interaction was higher when information about the LCP and CAP was presented in a more formal setting, such as a City Council meeting, a community forum, or workshop. Nancy noted, "Most participation occurred during formal meetings. That's where people would show up for the most part."

Surveying the Community. The Resilient Imperial Beach survey data were collected and reviewed as part of the document analysis for this research. The survey data were important for this research in understanding how the general community conceptualized the climate action the city was considering. These surveys were conducted by the city to gather input on preferred shoreline protection devices, preferred modes of transportation, and perceived challenges the city was facing due to climate change and its impacts. Results of the first survey were used to inform the city's priorities in the CAP, LCP, and GP. The survey was conducted live during the joint session on February 14, 2018, according to document analysis and participant interviews. It was

also available on the city's website from February 14 to April 10, 2018. The city received 335 completed responses.

In reviewing survey responses, I found many survey respondents prioritized two measures that were in opposition to each other. Overwhelmingly, respondents prioritized maintaining beach access and expanding commercial uses of the beach to stimulate the economy. But when respondents were asked which shoreline protections they favored, the most popular response was "It should be handled on a case-by-case basis" (31%). This response should have told the city more community education was needed, because it is not possible to handle shoreline protections on a case-by-case basis. The second most popular responses for adaptation and mitigation measures were "Seawalls and hard infrastructure" (22%). This should also have told the city that survey respondents did not have a good understanding of how seawalls work. Seawalls ultimately result in lost access to the beach, which is counter to what 80% of respondents say they want when they express support for expanding commercial uses along the Bayfront in Imperial Beach. If seawalls are put in place, the economic benefit of beach access on Seacoast Drive would be gone. These survey data were triangulated using public comment cards that shared similar sentiments.

Despite conflicting responses, this survey was an important tool that helped to inform city officials about priorities of city residents at the time it was conducted. It also illustrated though environmental quality and water quality were selected as the most important challenge facing Imperial Beach by 45% of the respondents, respondents needed more education about possible adaptation options. Through analyzing survey data, it became clear knowledge of community members who responded to the survey about climate adaptation was not to the level the city assumed. It also became clear understanding the community knowledge base is really important

for determining how best to engage residents that might not engage or see the need to have an understanding of climate change impacts and possible adaptive solutions the city was considering.

The second survey asked about residents' preferences for specific measures. Respondents were asked whether or not they supported a requirement for solar on all new commercial buildings and if energy audits should be conducted on homes if they are sold or remodeled. They were also asked if they supported continuing ongoing partnership to conserve local wetlands, plant more trees, and encourage more ridesharing programs. Results of this study were not made public, but in theory, were used to guide the CAP and LCP.

Engaging Local Residents. As interview participants discussed, engaging local residents who were not participating in the climate action planning process was crucial to the long-term success of the city's climate action strategy and future planning. However, engaging city residents who were not already part of the conversation in a planning process many viewed as overly technical was not easy, as study participants noted. One successful effort to overcome this obstacle to engagement was how the city capitalized on existing community activities residents were already engaged in, like winter storm preparations. In the fall and winter of 2015, as the city educated its residents on how to prepare for the next El Niño and coastal flooding it would bring, they found these sessions opened the door to discuss climate change impacts with a wider community audience. Sessions were advertised via city channels, and fliers were obtained from the city website and reviewed in the document analysis portion of this study. Residents were provided with information on how to obtain free sandbags and how to shelter in place, and given information about the impact of climate change on the city. Mayor Dedina was quoted in the local paper saying, "It's not easy to get people to think about what's going to happen in 100

years. But we did learn the way to frame that discussion is through coastal flooding, because it's less abstract and there are practical things you can do to address it" (Guidi, 2018, para. 9).

Study participants noted leveraging an existing educational and planning process allowed the city to bring more people into the conversation about climate adaptation. Additionally, city staff noted having conversations about adaptation planning under the umbrella of planning for increased coastal flooding was helpful in understanding what options the community would find palatable. Again, as noted by study participants, the population of city residents participating in these meetings was already experiencing some climate impacts, which Imperial Beach expects to worsen in the coming decades. This group did not have to imagine what it would be like to lose the southern part of Seacoast Drive, because they experience not having access to it for several days at least once during every storm season.

When study participants were asked about how the city engaged residents who were not involved with the climate change discussion, the majority of participants reaffirmed the mayor's comments. Participants said the discussion needed to be framed to allow difficult topics to be discussed in a way the community would find palatable. For example, participants discussed the importance of building the climate change discussion into existing community meetings, council meetings, and meetings of boards and commissions to help deepen the feedback the city received. Steve also commented specifically on winter storm prep meetings, noting this topic was something people generally cared about, wanted to talk about, and viewed apolitically. He noted, these meetings could become a launching point for a larger climate change discussion with community members who might not have otherwise engaged with the process.

During these meetings, participants noted community members talked about coastal flooding from king tides. More frequent king tides in the city have resulted in major road

closures for up to 3 days at a time because the sand and water needed to be cleared from the roadway. Anchoring the conversation in a subject the community was familiar which allowed for discussion of future impacts of coastal flooding in Imperial Beach with a frame of reference for what it might look like on a regular basis. Using the 2015 El Niño as a reference point, Steve said the city framed the discussion in terms of, "It's only getting worse. What are we going to start doing? What are the triggers? And what actions does the city want to implement?" He also noted the city would provide discussion points such as, "If we lost the south end of our Sea Coast Drive due to flooding, high surf and certain high tides, what would we do? Do we start closing the roads to keep cars and people out of it because it is dangerous?" Residents already know what it is like when they cannot drive to the end of the road because of flooding, so as participants familiar with these meetings noted, it is an easy frame of reference to help people think through what the future would look like if these areas are subject to regular flooding and closures, and if roads were eventually not accessible at all.

This research, via interviews and document analysis, also showed grounding discussion in a life experience was an entry point to engage people in the climate change discussion. The life experiences of Dave and Ed, two longtime residents of Imperial Beach who were in their 60s, highlighted tying climate impacts to personal experience may be the best way to engage a wider community in this conversation. Dave and Ed both became engaged with the climate change discussion when they saw what a changing climate meant in their own lives. Both participants expressed most people cannot comprehend the magnitude of what may happen, as a result engaging certain parts of the population is not possible without a catalysis, like winter storm prep or experiencing significant flooding. As Ed noted, "In the last century, sea level has risen 8 inches, and now they are saying it will raise 7 feet, that is kind of hard to grasp." If the

city can help residents tie the increased number of king tides, which impacts them in very real ways, to climate change, they may be able to engage a larger portion of the population in the climate action planning process.

Both Dave and Ed cited experiencing El Niños in 1983 and 1987 as events that caused them to understand what damage a warmer ocean could do and as a result, they began to pay attention to climate change and its impacts. Ed commented:

> A guy came in [to my office] to talk to me about climate change, well they called it global warming then. I was like 'There's no way!' It was tough to comprehend, and I thought he was a wacko, frankly. But you know, as I saw more and more about it, I realized he was right. The El Nino in the bay in 1987 made the tide almost a foot higher than it was supposed to be because the water was warmer.

As illustrated by Ed's own personal experience that catalyzed his engagement with climate change issues more than 30 years ago, having an experience or frame of reference helps residents understand the impacts of climate change, and can be an entry point to bringing more people into the conversation. Document analysis supported this finding. City Council meeting minutes and public comments regularly featured community members referencing how storms were worse, biodiversity was less, and the beach was more polluted now than in previous years. The wider the net of community involvement the city was able to cast when collecting feedback on the issue of climate adaptation increased community buy-in for the final version.

Challenges in Community Engagement

Despite successes Imperial Beach had engaging the community, study participants noted the city faced some challenges when it came to engaging certain portions of the population. Participants noted the city struggled to get new people involved in the conversation and when

new people tried to engage, it was not always easy. As one participant put it, if they could deduce what the city was talking about from "jargon-laden newspaper ads," it was not always easy to find the documents and resources. Participants felt the city needed to do a better job engaging people beyond the usual suspects.

The Unusual Suspects. When participants spoke about community engagement, they commented on the difficulty in bringing new people into the conversation. When Ashley was asked about getting local community members who were not already engaging with the issue to come to City Council meetings, specifically around the LCP and CAP, she noted, "It's hard to get new people out, and I have an engaged base to pull from." Nancy noted though the community is engaged, "it seems to be the same familiar faces always coming before city council," and engaging people outside of "the usual suspects can be challenging." Steve echoed this sentiment saying, "There's a lot of the general public coming up [to City Council]. But it's the folks that are really concerned about it [climate change] bringing this up." In reviewing sign in sheets for CAP workshops, many names were familiar from participant interviews, supporting the claim the same people reliably show up but the city struggles to bring new people into the conversation.

Ashley went on to say the average city residents do not always have the contextual understanding for why they should care about an LCP or CAP because cities do not do a good job of explaining the context. This finding was confirmed by the survey discussed previously. A portion of the population who responded to the survey did not understand you cannot have a seawall and a beach, at least not long term. In an unsigned public comment card from a CAP workshop, a community member wrote she was supportive of expanding the beachfront and

adding more shops and restaurants, while preserving the beach with infrastructure. This public comment supports Ashley's point of workshops being, as she said:

> either overly simplified and boring, or citizens have no context of how these things impact them. Like everyone loves trees, but their impact versus community choice energy or expanded public transit is so small [in terms of climate change mitigation]. And those kinds of things are not conveyed well.

She followed this statement noting the city might need something like an intro to climate action plans or something similar for the community, so the citizen who is not informed has context to become engaged and meaningfully contribute. As noted by participants, the city was attempting to provide community members with some climate change planning context via existing programs like winter storm prep meetings. This model might be an additional opportunity for the city to provide some education around climate action planning for its community members who are already participating in city programs and events.

Engaging the Aging Population. Nearly universally, participants spoke about how crucial it is to engage the aging population of Imperial Beach in the climate change conversation. Participants in this study ranged from 30 to 70 years old, so it can be reasonably assumed there is a wide spectrum of age groups participating in this conversation in the city, even though demographic data are not collected in any public documents reviewed in this study. This end of the population spectrum can be hard to engage on this topic because, as Katy Fallon, owner of the popular beach café, Katy's Café, was quoted in the local paper saying, "I hate to say this, but when it comes to sea-level rise, I know I won't be alive for the worst of it" (Guidi, 2018, para. 12). Katy, who was in her mid-60s, attended many community meetings initially because her street is flooded every year with king tides and her surfing plans were regularly canceled because

the beach was filled with pollution. Toward the end of the process, she got busy and quit attending meetings because she felt she could not solve the issue and she would not be around for the worst of the impacts (Guidi, 2018).

Through interviews, it became clear participants believed most of the aging population did not engage with the climate planning process because they believed it would not impact them. Ed noted much of the population who live on Sea Coast Drive and are in danger of experiencing the worst of the climate change impacts, are an aging population. He said, "Most of the people that own property on the beach are retired and maybe think they're gonna let the next generation deal with it." Dave noted he also saw a lot of that attitude as well and he understands it. "I'm 65. I know it's coming, but it's not gonna affect me as much as younger people." It is clear, though, engaging the aging population in the conversation was challenging because they believe it will not impact them, study participants believed their engagement was crucial because much of the property in the zones most impacted by SLR and climate change was owned by this group. As illustrated through participants' comments, addressing climate change and its impacts is something that cannot be done by solely the generations that will live through its worst impacts. It must be addressed by every generation.

Nonprofit and Community Groups Participation. Nonprofits and community groups are in a particularly valuable space to help the city engage different populations in the challenge of adapting to climate change, according to study participants. There are many groups in the city that engage with the broader climate change discussion and have done work to educate the local community about environmental issues in Imperial Beach, including but not limited to climate change and SLR. Wildcoast, Surf Rider, and The Climate Action Campaign were all mentioned by participants when asked about groups focused on climate action and environmentalism in the

city. All of these organizations also submitted letters to the city about the CAP, and issues they believed should be prioritized. These letters were reviewed as part of the document analysis. Leonard, a city resident and study participant, noted Wildcoast in particular had been working on shoreline protections for quite some time, and the nonprofit's executive director was also the mayor of Imperial Beach, Serge Dedina. Anna noted when nonprofits and community groups reach out to her specifically, or the City Council more broadly, she always schedules a meeting with them to better understand the work they do in the city and what their concerns are. Anna stated the first meeting she took after she was sworn into the Imperial Beach City Council was with The Climate Action Campaign.

When it came time for local nonprofits to engage with the CAP, LCP, and GP, it seemed engagement happened too late despite the efforts of the city to encourage community organizations to be part of the process, according to study participants. Mark, a former city official, noted, "I was disappointed I couldn't get some of those nonprofits to engage sooner. I would email them. I phoned them, but nothing really happened until late in the game. That was unfortunate." Steve, another city employee agreed, stating:

> All of those groups [Surfrider, Wildcoast, Climate Action Campaign, Citizens Climate Lobby] were pushing for us to take more aggressive action in providing stronger mitigation measures to deal with climate change and sea level rise. But unfortunately, many of those groups spoke up late, and city council and city executive staff were listening to some of the earlier vocal groups who were protesting any effort to deal with climate change.

Mark also noted:

> When we got going on our LCP project, they [local nonprofits] were very, very late in advocating for a stronger climate change position. And so, unfortunately, a lot of their voices didn't get heard. My hope is they will engage in a more forceful manner in the future.

It was Mark's perspective not having this engagement sooner in the process prevented the city from including more aggressive actions, like managed retreat, in their final plan. This perspective from participants was confirmed in the document analysis. Although Surfrider, Climate Action Campaign, and Wildcoast all sent letters to the city expressing their support for the CAP and encouraging stronger action, letters were received in the late spring and early summer of 2019. The city was well into the final phases of the draft by the time the letters were submitted. Because the city was too far into the planning process, adding back in more aggressive actions they had removed because of community sentiment was difficult participants noted. Despite support from nonprofits for these measures, participants commented adding more aggressive measures back into the plan might have resulted in the city not being able to pass a plan at all and having to start over.

When asked about the delay the city and local nonprofits engaged in, there was some he said/she said talk. Participants from the city claimed they were calling and asking for support, and participants from local nonprofits said they were not aware the CAP was happening until late in the process. The upcoming section discusses some communication challenges around the climate action planning process that may have contributed to late engagement of nonprofits in this process. Ashley also acknowledged local nonprofits should take some ownership for paying

more attention and being a stronger voice in the public process, but she believed cities also could do more to engage nonprofits and groups around this, and other topics.

Ashley, who was connected with a local nonprofit, noted there is definitely a place for nonprofits to work together with a unified voice in an effort to generate more pressure on the city. In reference to the CAP, she commented, "We [local nonprofits] were kind of trying to show up for each other and support each other," but it is a fairly new effort at collaboration between local nonprofits. The groups are currently looking for areas of overlap to strengthen these bonds and create a more unified voice for climate action.

One item to note is there was no discussion or comment from participants connected with the city or local nonprofits of partnering with local nonprofits, nongovernmental organizations, and community groups already working in these areas to help the city address unique challenges these communities might face as a result of climate change impacts. The lack of evidence for nonprofits engaging in the climate action planning process certainly does not mean it has not been happening. However, it clearly has not raised to a level where there are established protocols for how the city leverages the expertise of these nonprofit organizations to address inequities in the community through climate change adaptation and resiliency measures.

There was evidence at least one member of the City Council did recognize the importance of support from local organizations in this process. In a letter sent from a sitting councilmember to the city manager, Andy Hall, Ed Spriggs encouraged city staff to think holistically about city planning so they could leverage public support of community groups for alternatives he believed would better support the city. Examples from his letter included shifting the city fleet to all electric vehicles to reduce carbon dioxide emissions which contribute to SLR and to develop a more thorough explanation of the adaptation timeline the city proposed and to

explain what could trigger a change in the timeline (Spriggs, 2019). The CAP was in its final stages when this letter was sent, and by that point there was little the city could do to incorporate input from local groups. Using established groups already working in Imperial Beach and San Diego county earlier in the process could have helped the city address these challenges more holistically. Participants believed the knowledge base exists, and the council is open to community input to inform their plan, but partnerships are not consistent or wide ranging.

Communication Mishaps. Many challenges participants noted the city faced in terms of community engagement were rooted in failed communication strategies. There were instances of engaged community members not being able to access materials or figure out how to participate in the planning process. If residents who were seeking draft documents of the LCP and CAP, and other information, were struggling to find resources in places where the city had said they would be, it is not reasonable to expect residents not already engaged with this process to seek out information study participants noted.

Digital Communication Challenges. Although participants stated Imperial Beach had strong community engagement during this process, it was nearly universally noted by each participant efforts fell short at times. As Ashley noted, "I give credit [to the city] for trying." But she followed that comment up with the observation for the general community member it is difficult to come and give your input if you do not have any real context about the subject. She went on to say, "Cities are not cool. They're not on TikTok. They're like 'Yeah, we posted on our Facebook page.' But who follows the city's Facebook page?" Through this statement Ashley pointed out the city has not been engaging residents via channels most residents use. If the city is not posting information in places people go to find information, it does little to encourage participation in the climate adaptation and planning process.

When Mark was asked about how in-person sessions were advertised, he noted the city did not do a good job of advertising and getting people to attend. He said, "I'm sure there's some outreach experts that know how to present information on the city's web page that would make the people, basically, pay attention. That would be a good thing." Dave made a similar assessment about the city web page, saying: "The website, you try to go in there . . . It's a great undertaking. I mean you can't find the information. Once again, I am very disappointed in our council and our mayor, and the lack of communication." In reviewing public notices available on the city website, they are difficult to read, written in yellow font with meeting times and places buried in long blocks of text. As participants noted, no one could understand what the city was even proposing. A save-the-date document the city shared was slightly easier to comprehend, but it was shared in a pdf on the city website, and to find it, interested parties would have had to hunt for it, just as participants said.

Dave also noted, though Imperial Beach is a small city with a limited budget, getting an intern with a good understanding of social media and digital communication could help increase turnout at events where the city is seeking feedback on plans and proposals. Participants believed if the city was able to better use communication channels residents use most frequently to gather city and community information, they may end up with a larger proportion of the community that has an understanding of issues and can more effectively engage in the planning process.

Written Communication Challenges. The lack of communication and information availability was reiterated again by Dave when he was asked how he found out the city was soliciting feedback on the LCP. He noted even getting a copy of the plan took extra effort.

He stated:

> I only found out about the LCP by seeing a notice randomly in a little paper called the IB Times. It is a little once a week, local newspaper that's passed out for free. It said, I can go view a copy at the Public Library and City Hall. I went to the library. They did not know what I was talking about. I went outside and got a copy of the IB paper and showed them. And they still said they didn't know what I was talking about. So, I went across the street to City Hall. They didn't really know what I was talking about until they actually verified it with the city planner who is responsible for the project. They had to go make me a copy- literally right here at the copy machine go and print off a copy- so I would be able to take it home. I actually had to come back the next day to pick it up.

It should be noted Dave, a habitat restoration specialist with a deeper understanding of climate change impacts than the typical resident, was willing to go to extensive lengths to access the information. Again, this is likely because he was already interested in the subject and connected to the issue as it pertains to him and the city, other residents were probably less likely to make the extra effort required of them to get a copy of the draft.

Interpersonal Communication Challenges. The city also faced challenges when it came to facilitating interpersonal communication during meetings and workshops. All participants commented on division around some adaptation strategies and how those differences of opinion resulted in a few contentious discussions. Leon Benham commented via a public comment card at a CAP workshop, "This meeting did not facilitate public understanding … [and] does not build trust in our city council. … VERY DISAPPOINTED." As Dave aptly put it, "You kind of need to get people talking to each other, instead of past each other in these forums." He further noted when people talk past each other in community forums, "it totally stops the discussion process."

If the process is stymied because people are uncomfortable, and distrustful of the city council, participants noted community issues remain unresolved and the plan may not take into consideration all viewpoints it should.

Ed echoed Dave's comment when he said, "When it gets kind of contentious, instead of seeing it through, they [city council and city staff] kind of back off and never really get past the conflicts, you know?" Leonard also noted, "Politicians do not want to get yelled at by their constituents," so they will back off hard conversations in a public setting. Ed surmised if you got a smaller group of people—that both sides trusted to talk about solutions—it would alleviate the issue of people saying outlandish things, not liking options, and yelling at politicians. This idea was triangulated through several public comment cards accusing the city council of deliberately not discussing options like sand replenishment and beach protection in a CAP workshop, and instead prioritizing regional groups, NGOs, and state agencies like the Coastal Commission. As Leonard put it, you can talk about reality but "Politicians don't get yelled at and you also don't end up with mad constituents." As noted previously, the city developed the steering committee for just this purpose, but it was not entirely successful in insulating discussions from tense or contentious moments. In this particular case, presenting a curated list of options for adaptation did not help the city avoid difficult conversations and might have added to their challenges in creating a CAP.

Misinformation Campaigns. Anna and Leonard both noted there was an active campaign to spread misinformation and conspiracy theories, primarily through attacks via social media. Anna noted, "We have the same faction of people saying that the science is a hoax and subjective, that nothing is happening and that the government is using it [climate change] as an

excuse to enrich ourselves." Anna, when she was asked about whether or not politicization made progress difficult, had this to say:

> It's not without its challenges, because you have a small fraction of individuals that politicized the issue, or use it as an excuse to engage in racist rhetoric that's fueled by our [federal] administration… It's a little challenging, it isn't catastrophic, but it does hinder some of our efforts.

Though this hindrance, as Anna stated, was not catastrophic and did not derail the plan fully, it did derail the strategy of managed retreat many participants in this study believed was the best option for Imperial Beach in the long term and could have provided them the best chance to maintain their community.

Collaboration: Both Local and Regional

As a result of Imperial Beach's close proximity to Mexico, the need for regional and international collaboration was featured prominently in interviews and it was explicitly stated in the most recent version of the City of Imperial Beach's LCP. Universally, participants spoke about the need to collaborate more effectively with local groups and government agencies working in climate change adaptation, resilience, and mitigation space. Successful collaborative strategies have been discussed and the opportunity to collaborate not only in the city, but across the region was explored.

We Are All in This Together: Collaborative Climate Action Planning

Participants, as discussed in their interviews, viewed collaboration as a key component to the climate action planning process. Participants stated successful collaboration was crucial in forming a CAP and LCP that took into account not only how climate change will impact the city, but also the region. Participants indicated the city recognized they could not develop a plan

without understanding how regional climate impacts will play out in regard to the city. As a result, participants noted the city prioritized having employees and staff actively participate in regional groups working to address climate impacts, such as the San Diego Climate Collaborative. This finding was also confirmed through document analysis as the City of Imperial Beach (2019a) specifically addressed climate adaptation work not being able to happen in isolation and the following excerpt speaks to the interconnected nature of climate adaptation work and illustrates the priority the city placed on collaboration. City of Imperial Beach (2019a) stated:

> Through an integrated land use plan and economic development strategy, the City seeks to foster a position of fiscal strength that will enable it to provide services and amenities for current and future generations. However, the City cannot address these complex issues in isolation; these issues must be resolved on a regional, and in some cases, international basis. Successful long-term implementation of the plan will require a systems approach with monitoring by a dedicated citizenry, and ongoing, proactive collaboration at all levels of government and the private sector (p. I-10).

When asked about opportunities available to the city to collaborate regionally, Nancy noted, “We can get focused in on our city and that’s really important. But understanding that these are bigger issues that really impact regions is a huge thing. We should all be working together to really make it better.” Given the unique challenges of addressing climate impacts holistically, Nancy stated, “It’s appropriate to have this discussion happening and being led by a regional group.” On behalf of the city, Nancy has participated in an adaptation working group though the Regional Climate Collaborative, which is made up of different cities in Southern California. The group comes together to discuss what actions are being taken for adaptation. She

indicated, “It’s an opportunity to really dive deep into what’s going on with everybody in this region.” She also noted this group provides a vehicle for information sharing between cities and opens up the opportunity for partnerships to be developed more easily.

Educational and Research Institution Collaborations. Through participant comments and confirmed through document analysis, it was evident the community and city placed a priority on collaboration. Not only has Imperial Beach strove to collaborate with coastal neighbors, but the city has also worked to support the work of local and regional educational institutions and researchers with an interest in understanding climate change impacts and challenges the city is facing, according to study participants. Steve noted:

> Because we’re on the border there’s interesting issues that researchers like to study. We are open to discussion about the impact of sea level rise, so we let any researcher on to our beach, or whatever. We work with SCRIPPS oceanography, with UCSD . . . We do partnerships with San Diego State, in terms of binational pollution from the Tijuana River. We do climate planning and research work with USD, as well. And then we do hydrology modeling with UC Irvine. And we’re open to anyone who wants to do work, sure we’ll help them out.

Nancy noted the city has been coordinating with SCRIPPS Institute of Oceanography Resilient Futures Program for quite some time. She went on to explain the program uses tide gages, videos of the shoreline, and even what grain of sand is seen on the shore to understand changes in the width of the beach, and frequency and severity of flooding in different parts of the city. Nancy noted the city hopes to be able use these data to understand if the measures they are currently undertaking are the best methods for adapting to climate impacts. Although there is no

evidence of these partnerships on the city website, there are numerous news articles linking the research referenced previously and the City of Imperial Beach.

Nancy further noted as part of the LCP and GP update:

> We're implementing a sea level rise area adaptation strategy checklist, and that's sort of our guideline to figure out what we want to monitor and how we're going to do it and we want to make sure we collect that data.

As Nancy stated, being able to use SCRIPPs in particular to collect and analyze data the city would not be able to do on their own has informed the decision-making process in the city to some degree. According to Nancy, SCRIPPs provides regular reports to the city for educational and review purposes, but these reports were not included on the city website or in any documents provided by the city clerk.

Steve also mentioned there is a National Oceanic and Atmospheric Administration research center, one of only nine in the county, in the Tijuana River Estuary studying impacts of climate change on wetland ecosystems. Steve opined that "because the estuary has such a large presence [physical footprint] here in the community, they have a very large voice of providing education." He also noted the Tijuana Estuary is home to a coastal training program Tijuana River National Estuarine Research Reserve (TRNERR) Program, expressing "Their mission is to engage and communicate with the public and educate them on issues related to climate change." The program has the stated goal of providing hands-on, thematic, bilingual environmental education to the community, local schools, groups, and government agencies (Tijuana River National Estuarine Reserve, 2021). This program is showcased on the city website and referenced in the early climate action planning documents. Several workshops were also held at

the Tijuana Estuary, further supporting the finding these collaborations are ongoing and beneficial to the climate action planning process; however, there is room for improvement.

Though this is clearly a great resource for the community and the city supports TRNERR, it should be noted Steve was explicit when saying this active education and research arm of the community has been a completely separate entity from the city. Nancy stated the city has been using information SCRIPs collected through their Resilient Future Program to understand if they are using the best methods to protect against flooding. It was unclear how, or if, information collected via these institutions and researchers, with the exception of SCRIPPS, has been filtering back into the city.

What is clear from participants of this study is there was a desire to see more information gained from these studies shared with the city in an educational format. Dave and Ed both commented knowing what the current research is indicating for Imperial Beach specifically would be of interest to them, and they thought, the wider community. Dave spoke at length about how educating residents about the rare ecological make up for Imperial Beach would, in his opinion, increase engagement with the climate change discussion and promote conservation. Dave noted:

> Understanding leads to appreciation, appreciation leads to protection. So, it's a direct link. When you give people the information in a nonpolitical format that's based on science, hopefully they can then make an educated decision. Then we aren't making a decision that flies in the face of science.

It was clear, for some participants, a lack of connection to and awareness of the valuable ecosystem found in the Tijuana Estuary seemed to be a potential opportunity of engagement for the community. As Dave and Ed both noted, if residents do not understand the special ecological

system they are living in and near, being involved in climate action planning is likely not going to be something with which they will willingly engage because they are not connected to the issue. A lack of awareness of, and connection to, the research and educational work the city is supporting does not help to encourage residents to be involved with the climate action planning process of the city, because they do not understand its importance. Coincidentally, all study participants have an understanding of the coastal ecology of Imperial Beach developed when they were children, teens, or young adults. This understanding was likely what has led to their prolonged and continued engagement with climate change and climate action planning in Imperial Beach.

We Cannot Tackle This Without Support: Challenges in Collaboration

Collaborating across intuitions, even in the same city, can be difficult as this study found. Working across international borders creates a whole host of additional challenges. As previously stated, Imperial Beach is located on the border between Mexico and the United States. Despite being impacted by border issues, the city, according to participants, has very little ability to work with the city of Tijuana to address those issues without support from the U.S. federal government. As a result, it can complicate climate action planning for the city.

Cross-Border Sewage Pollution. One of the biggest environmental issues participants discussed was Imperial Beach deals with cross-border pollution coming in from Mexico. It is also one challenge the city has very little ability to deal with on their own. Leonard, Anna, and Steve all noted pollution comes in from Mexico because the sewage infrastructure in Tijuana cannot keep up with the number of people who have moved into the city for work in recent years. Anna said, “The city of Tijuana continues to grow and put pressure on the infrastructure

that's already dilapidated and falling apart." Dealing with cross border pollution is expensive, and as Anna pointed out, "The city is not wealthy."

This problem was also addressed in three city council meetings, two during general public comment and once as an agenda item. The city also has communicated about this issue regularly. It is not uncommon to see signage posted at the beach advising swimmers and surfers of the presence of pollution after a rain or information posted on the city Facebook page. There is also a direct link on the city website to the Beach and Bay Water Quality Program that provides real time information to residents about the safety of the ocean water. Over the course of this research, it was not uncommon to visit the Imperial Beach city website and see a beach closure noted because of sewage contaminated runoff from the Tijuana River.

Presence of cross-border sewage pollution in Imperial Beach is expected to worsen as the SLRs. Anna, a study participant commented, "We have an extremely dangerous issue related to cross border pollution. We have a sewage crisis related to the Tijuana River and to the shared nature of that international watershed." Anna noted this struggle will worsen as climate change impacts like flooding and SLR become more frequent and aggressive. She also stated, "Now with climate change and SLR we are seeing those problems exacerbated. It is interrelated." Anna elaborated on this concern, saying:

> Because of cross border pollution we have stagnant waste tides that collect sewage water, which brings invasive species of mosquitoes that are now proliferating more and more because our weather patterns are changing drastically. Now there is an increase in mosquito proliferation and these invasive species can bring deadly diseases like dengue and chikungunya and zika. That's a huge concern even if you don't go in the water, and when you do go in the water obviously that's a huge public health risk. Now the most

recent concern is the pollution in aerosol form and incidents of kids getting sick when the beach is closed without even touching the water.

When asked how the city addressed this issue with the city of Tijuana, Steve noted the City of Imperial Beach does not work directly with the city of Tijuana to address the issue of cross-border pollution because of the international nature of the issue. He added, "Frankly, the City of Imperial Beach does not have the funds or infrastructure to address this issue on our own;" however, the City of San Diego does work closely with the city of Tijuana and has taken sewage from the city of Tijuana since the 1990s when they built the international wastewater treatment plant in an effort to lessen the occurrence of an overflow. The plant is run by the International Boundary Water Commission and that agency has the responsibility to manage and treat sewage. Steve noted, "You can work really closely with our local, state and federal partners and partners in Mexico to come up with solutions, but without dedicated funds, specifically for solutions, the problem won't be solved." Mark noted the city was involved in a sewage lawsuit and the federal government has promised money to Imperial Beach to help them address the issue, but as of the writing of this dissertation, no funds have arrived to address the ongoing issue and sewage pollution was still impeding the use of the beach and estuary in Imperial Beach.

The unfortunate reality is even if Imperial Beach was able to complete every item on their CAP checklist, the city would still be impacted by regional issues like sewage pollution, air pollution, flooding, and SLR. The city cannot address these issues on their own and needs support from the federal government to adequately tackle these challenges.

Environmental Justice

As illustrated in previous sections, meeting people where they are and bringing more people into the planning process is crucial in developing a plan that is holistic, just, and approved

of by constituents. In any planning process, it is not always possible to get everyone to the table, and participants noted building in safeguards to protect potentially marginalized groups of people and communities is important. The City of Imperial Beach recognized they had an obligation to craft a plan that worked for all of the community and as a result included an environmental justice component in their plan. Environmental justice is the idea everyone deserves the same degree of protection from environmental risk regardless of race, ethnicity, or socioeconomic status (Environmental Protection Agency, 2021). As noted by participants, including an environmental justice component in the CAP and LCP is Imperial Beach's effort to ensure all community members are given equal access to the decision-making process and provided the same degree of environmental protection regardless of socioeconomic standing. Identified through document analysis, the City of Imperial Beach (2019a) LCP stated:

> Environmental justice is achieved when everyone, regardless of race, culture, gender, disabilities, or income, enjoys the same degree of protection from environmental and health hazards. Furthermore, it is achieved when everyone has equal access to, and meaningful participation in, the decision-making process to have a healthy environment in which to live, learn, and work. (p. L-17)

This was not only the attitude of the city overall, but every study participant also connected some impact of climate change with an underlying social vulnerability and talked about the need for a holistic plan to address issues of social and environmental justice and equity during the CAP and LCP process. Nancy commented when the city was thinking about resiliency and adaptation measures, they wanted to be sure they were "identifying social vulnerabilities and actually addressing the needs of the people and dealing with the inequities [that exist in our community] with [their] responses." Nancy's point underscored the city's desire to solicit diverse

perspectives during the planning process and is significant because oftentimes voices of those without political power and money are left out of the decision-making process. However, the city has stated in no uncertain terms environmental justice is a crucial part of the plan's success.

Although the city is ultimately responsible for what measures are included in the final CAP and LCP, Ashley noted it was in this area local nonprofits had a significant hand in the planning process. The work of local nonprofits ensured environmental justice was included in the final draft of the plan. In one interview, Ashley commented:

> We try to bring up that equity and environmental justice should be a component of all climate investments and climate commitments. In the climate action plan and LCP that was passed, we did get them [the city] to commit to an environmental justice section where they would prioritize the efforts.

This finding was also triangulated via document analysis. The city received a letter from the Climate Action Campaign, which stated:

> Environmental justice and social equity play an inherent role in protecting our environment and supporting healthy communities. … We recommend that the CAP include an Environmental Justice section to ensure that the communities within the City with the greatest environmental health risks from climate change and pollution are the first to benefit from the implementation of CAP strategies… We also recommend the development and implementation of this section take place in consultation with a diverse set of stakeholders from the most impacted of the City's communities.

Letters from the Surfrider Foundation, Southwest Wetlands Interpretive Association, and private individuals referenced a similar concern. Ashley noted the organization she worked with does partner with groups focused on equity when they can find overlap between what they are fighting

for and climate interests of her organization in an effort to create a louder voice for equity in climate action planning.

Without the work of nonprofits to elevate environmental justice as part of the climate action planning discussion this piece might have been left out. Interestingly enough, the city itself has been facing a serious environmental justice issue regarding cross-border pollution they are unable to protect themselves from, but no participant framed the issue that way.

Economic Disparity

Study participants noted a significant contributing factor for environmental injustice is economic disparity. Economic disparity can keep people and groups out of decision-making processes. As Anna, a study participant, noted addressing climate change is not inexpensive, and the City of Imperial Beach is not wealthy. As an elected local official, she recognized parts of the community will not be able to address challenges resulting from climate impacts without support from the city and other governmental agencies. During her interview Anna said:

> We don't have a lot of money, but our Climate Action Plan does have an environmental justice component to it. We want to make sure that when we do those vulnerability assessments, we don't lose anybody. … We're so small that you may have a string of affluent homes, right up against a multifamily complex, where people who are lower income are living. We just want to make sure that nobody falls through the cracks.

Anna, Steve, Ashley, and Nancy pointed out the city was already thinking how they can support community members who may not have the ability to adapt to climate impacts without significant support. Specifically, this applies to mobility, and being able to move certain portions of the community away from danger associated with king tides and SLR. The previously mentioned participants talked specifically about seniors and individuals on a fixed income who

will struggle with the expense of adapting to climate change. Nancy noted the city has an older, aging population, and a low-income senior housing facility that will be impacted by SLR. She said:

> Those are the individuals that you struggle with the most when you think about how they're responding to a hazard. They're the ones that are going to have the most difficulty when their property is damaged. How are they going to repair that, or how will they be evacuated? That is something we're definitely trying to think about.

Ashley pointed out the organization she worked with was instrumental in getting the environmental justice component included in the CAP. She credited this to the fact her organization was already partnering with a group focused on getting more affordable housing near public transit routes in Imperial Beach because access to mass transit is a key climate change mitigation strategy. As a result of this partnership between two nonprofits working together, the City of Imperial Beach included affordable housing near transit lines as part of their CAP. As two letters the city received about the CAP pointed out, having access to affordable housing near public transportation reduces the need for single passenger car trips, reduces the economic burden on residents, and increases access to more opportunities for a wider portion of the community. A commitment to affordable housing near public transit is a key climate change mitigation strategy and also increases community equity. As participants and documents analyzed noted, climate change adaptation is not a one-size-fits-all strategy, even in a single community or city, so working to address specific challenges is crucial to the success of the plan as a whole. As illustrated previously, community collaboration has the ability to address climate impacts in a way that increases equity across the city.

Political Polarization

The City of Imperial Beach, as noted previously by a participant, has what many residents consider to be one of the most aggressive climate action plans in the state of California. But as participants noted and the plan itself revealed, it failed to include two words: managed retreat. The concept of managed retreat is a phased relocation that prioritizes preservation of the beach and its associated ecological and recreational benefits above protecting property (City of Imperial Beach, 2016). Steve indicated it has become "politically toxic." Although there are many ways to implement managed retreat, the recommended path for Imperial Beach would be to purchase property along the coast and provide a lease back option for businesses and residences (City of Imperial Beach, 2016). The SLR study noted through this option, the city would be able to generate some revenue prior to removal of current shoreline armoring. Once the armoring that currently protects the coast is removed, the coast will start to erode inland as SLRs, damaging buildings and infrastructure. According to participants, Revel Coastal and the city recognized this idea was not appetizing to many people in the community; however, according to the Sea Level Rise Study of Imperial Beach conducted by Revel Coastal, it is the most economically feasible and predicts the best long-term outcomes for the city.

Given the Sea Level Rise Study found managed retreat as the most viable and economically feasible option for addressing the most severe climate change impacts Imperial Beach is expected to experience, this omission was noteworthy. Absence of this term was commented on by every participant without exception and was referenced in no less than six letters the city received. From interviews conducted as part of this study, it became apparent a vocal minority successfully prevented the city from including managed retreat in the most recent LCP and CAP by engaging in a misinformation campaign about climate change, and adaptation

and resilience measures. This was despite efforts of the city to encourage and solicit feedback from community members, nonprofits engaged in climate change work, and groups who believe more aggressive climate action strategies should at least be included in the LCP and CAP for discussion and consideration.

Do Not Use THAT Word: Managed Retreat

Some challenges the city experienced during this process, especially related to the idea of managed retreat, seem rooted in political polarization. As Leonard, who was married to a former city council woman, said, "when I started becoming more involved in local politics, I found out that it is extremely polarized here. And you know, perhaps exacerbated by the current administration in Washington." He went on to note:

> One would hope that some of the issues, you know, the sea level rise, climate change, and things like that, that Imperial Beach is facing would be more or less nonpartisan. But they are not. They appear to be divided along party lines.

This division became increasingly clear as the city addressed concerns around the climate adaptation strategy of managed retreat. The idea of managed retreat became conflated with imminent domain and property rights in the City of Imperial Beach, despite the fact managed retreat was proposed as a strategy to protect public infrastructure, not take private property. Nancy explained the disconnect as such:

> I think in general when people hear that [managed retreat], they hear illegal taking of their property. And as a property owner that would scare anybody. Obviously, the way that we interpret that from a policy side, is that it has been considered a viable option for resilience and adaptation. From the perspective of somebody who owns property, they're

> wanting to see that as very different. It really triggers a defensive response, to a certain extent, which is understandable.

Steve echoed this local understanding of managed retreat:

> I just know that the term [managed retreat] in general, here and elsewhere, has kind of become taboo, because immediately people's minds go to eminent domain for some reason. . . . [managed retreat] has nothing to do with private property, in our case, we're looking to protect our public infrastructure.

As Ed noted also, "The term managed retreat somehow got tied in with eminent domain, even though they're not the same term. Everybody kind of took that and ran with it, saying they're gonna try to take your property." He further noted, "Managed retreat is really not a popular subject with people that live on the beach, or near the beach," and implied it was largely because those residents are Republicans, climate science deniers, wealthy, or all three.

As several participants pointed out, property rights are more often associated with Republican party values, which has contributed to putting residents on opposite sides of potential solutions to addressing SLR. As Ed articulated, "Typically, property rights are more of a Republican talking point than Democrat." Dave noted opposition to managed retreat "comes from people who live on the beach, and, I hate to generalize, but, you know, people who voted for Trump, or Republicans, particularly, that deny what is happening." Mark noted at City Council meetings you had:

> folks from the climate denier perspective saying, "Don't you dare mention managed retreat," or some of those other unappetizing strategies. So, you had basically those two groups in contention with the City Council caught in between.

Steve, who was closely involved in the LCP reaffirmed this political division in the city, expressed:

> Most folks who were protesting a lot of our [city] proposed policies, especially managed retreat, were coming from the orientation of climate change denial. They basically shut down city officials' efforts to try to propose some sort of a long-term policy to meet this imminent threat of climate change.

Because voices in opposition of a strategy of managed retreat came out early in the process and were most vocal, their feelings drove the city strategy, or lack thereof, in terms of managed retreat.

When asked about the contentious feeling around the term managed retreat in the city, Steve noted, "No city uses the phrase managed retreat anymore. It has become politically toxic." Notably, two other participants used the term politically toxic when discussing the idea of managed retreat. When asked about removal of managed retreat as a strategy from the LCP and CAP, Dave said, "I don't think he's [the mayor] changed his mind. He knows ultimately it is probably the way to go … but just didn't want to deal with the political backlash. Politicians don't like being screamed at."

This finding from interviews was triangulated through document analysis. As noted previously, managed retreat was mentioned in several letters the city received about the CAP and these letters encouraged the city to include managed retreat in the menu of options for consideration. Robert Hawley, in a letter dated May 2019, stated:

> By not addressing or including the benefits of "managed retreat" you are turning a blind eye to what I know some of you understand is the only term solution to protecting our community resources. It appears that a vocal minority has persuaded the powers at be to

"kick the problem down the road" to future leadership even when knowing what the inevitable outcome will be.

Preserving the Status Quo

Participants noted—and it was confirmed through document analysis—there was a strong desire to preserve the status quo in Imperial Beach. Participants noted the desire to preserve life as their neighbors know it leads to an inability to listen to one another and learn from each other. As Mark pointed out:

> The adaptation strategies are probably looked at as very threatening because the options for trying to preserve the status quo are not very good. If you try to build a wall around your city, the Coastal Commission frowns on putting up walls. The other idea of retreating to higher ground, well we don't have higher [ground]. We could only move back. And that means for a great number of people who have oceanfront dwellings, that they basically sacrifice what it is that they have invested in. And so, the idea of doing that is something they don't want to face. They're looking for an explanation as to how to preserve their investments.

Dave noted the city has made efforts over the years to protect the coastline and property, many of them expensive, and ultimately failures. Dave believed this was because Imperial Beach is a small town with very little economic or political influence, and as a result people were desperate to protect their property. He said, "They'll accept anything. And everything they tried failed. I've seen a lot of these disasters literally right outside my front window."

When Steve was asked about preserving the coastline, he said, "In reality you have the most influential and most politically active residents along the coast." As a result, the city is going to continue to try some preservation measures like sand replenishment before entering into

the territory of costly lawsuits over subjects like managed retreat. Leonard believed some measure of protecting the status quo was worth it, such as ensuring the beach is still usable and accessible, but "I don't think it's fair to the community as a whole to undergo heroic and costly measures to save a handful of properties."

In reference to those most likely to speak up, Steve said:

> When you have the wealthiest residents being the most vocal about not considering managed retreat as an option to deal with climate change impacts on a city-wide level, the city will not implement a local policy that causes an unnecessary lawsuit.

Mark expressed the opinion that the city would be reluctant to use managed retreat as a strategy without a legal determination from the state of California on how to address climate change in the coastal zone. Mark also noted preserving the status quo might not even be possible. He said:

> If houses get washed away. If roads and utilities get washed away. And if the providers are unwilling to replace those damaged utilities and infrastructure, then there is no residential area that needs to be preserved because they can't be supported.

It was confirmed through document analysis in some ways the city itself was trying to preserve the status quo through the development of the CAP, LCP, and GP. As the the City of Imperial Beach (2019a, p. I-1) stated:

> This General Plan celebrates these seemingly contrasting characteristics as assets upon which to further implement the City's longstanding "big picture" vision to maintain the City's "small-town, quiet, casual atmosphere," while also increasing tourism and appropriate levels of development to create greater economic stability.

As participants noted, the small beach town feel the city and its residents cherish cannot be preserved if the city is washed into the sea.

Summary

As illustrated throughout this chapter, climate adaptation planning worked best in Imperial Beach when the approach to planning was collaborative, informed by diverse perspectives and experiences, and grounded in science. This case study illustrated by fostering conversations are collaborative, engaging, and constructive, a city can adapt to, and cope with both current and future climate change impacts, while addressing concerns and frustrations citizens may have. The following chapter discusses what the data revealed about the process of developing a CAP that is supported by the city, and what these findings could mean for Imperial Beach and other communities working to address climate change impacts.

CHAPTER 5: DISCUSSION

Climate action planning has become a focus of city governments worldwide, especially for coastal communities (Heikkinen et al., 2020). If you reside in a coastal community in California, the state mandates the city to plan for increasingly unavoidable climate change impacts cities are projected to experience (California Public Law, 2020). The case study of Imperial Beach's climate action planning process showcases how one city has been coping with inclement climate impacts via development of a climate action plan (CAP), local coastal program (LCP), and general plan (GP). This case study highlighted how development and support of a CAP depends largely on community engagement and is shaped by the context in which the planning process is happening. Data for this study were collected in an effort to understand how this particular community copes with and adapts to climate change impacts. Data were analyzed with the hope of understanding how one climate action plan came to be, and what that could mean for other communities working to address and plan for climate change impacts.

Cities are in the position to help residents cope with and adapt to climate change. As this study illustrated, a city cannot develop a plan that supports its residents without input from a wide variety of sources including residents, businesses, local organizations and nonprofit entities, subject matter experts, and city staff. This study illustrated the climate action planning process is an iterative process that can last for years. It also revealed how a concerted effort to bring many voices to the planning table can create a holistic plan supported by the community and provides a strategy that allows for the community to address the challenge of climate change in an equitable way. The study also highlighted challenges that can stymie the planning process.

Major findings of this study include a detailed timeline of the CAP process in the City of Imperial Beach and themes important to the CAP process in Imperial Beach. These findings can

provide direction for the City of Imperial Beach as it moves forward with additional climate action planning, and adaptation and mitigation measures. It may also provide guidance to other cities and communities developing a CAP aimed at helping their communities cope with, adapt to, and address climate change impacts.

The city executed a CAP, an update to the LCP, and an update to the GP that all work together to address climate change impacts in the city and were informed by the community in various ways (City of Imperial Beach, 2019b). Factors like an existing base of residents who were accustomed to engaging with the city and its council members on city initiatives, and an inclination by many residents to be generally concerned about the environment, made this process easier. Unfortunately, other factors (e.g., political polarization) stymied the climate action planning progress in some areas. In 2019, the City of Imperial Beach was able to release the first iteration of an action plan currently being used to address climate change and the impact warming temperatures have on the Imperial Beach community, its residents, businesses, and infrastructure.

This study demonstrated climate adaptation planning best assists the city, community, and residents in coping with and adapting to climate change when the approach to planning is collaborative, informed by diverse perspectives and experiences, and grounded in science—even when all these conditions are not perfectly met. When asked what was crucial to success of climate action planning, Anna said climate action planning is "a team effort from top to bottom. This is not something that can be done alone." As illustrated by the previous comment and as discussed in the following sections, the climate action planning successes Imperial Beach has had can be directly traced to the high level of community engagement in the process, and the effort made by the city to seek out perspectives, desires, and needs of its residents to inform their

plan. Though Imperial Beach's climate action planning process was not without challenges, this case studies illustrated by fostering conversations that are collaborative, engaging, and constructive, a city can adapt to, and cope with both current and future climate change impacts.

Summary of Major Findings

Using data presented in the previous chapter as the foundation, this chapter presents a summary and discusses implications of those findings for communities coping with and adapting to climate change. This chapter presents: (a) summary major findings and their link to relevant literature and framing theories of design thinking and pragmatism; (b) a discussion on leadership findings via the lens of complexity leadership theory; (c) limitations; (d) the need for further research; (e) a reflection on the challenge of coping with and adapting to climate change; and (f) how knowledge collected in this study can be leveraged by the city, community organizations, and citizens moving forward with climate action planning.

History of Climate Action Planning

The climate action planning process in the City of Imperial Beach was detailed in the chronological time-series analysis in the preceding chapter (see Table 4). This process was built over the course of nearly 10 years stemming from simply having city staff participate in working groups focused on understanding climate impacts regionally to hosting community workshops to discuss what climate impacts were happening and could happen in Imperial Beach and solicit feedback on the CAP, LCP, and GP. The time-series was critical to understanding how the climate action planning process happened in Imperial Beach and illustrated some events needed to occur before others to be effective. If certain events had happened out of sequence, the planning process might not have seen the success it did (Yin, 2014). It is also important to explore time periods of the case study because certain periods in this process differed

substantially from those of other periods (Yin, 2014). The relationship of the time series to key themes is discussed in the following sections.

Key Themes

Key themes found in this study were Community Engagement, Collaboration, Environmental Justice, and Political Polarization. The City of Imperial Beach was invested in seeking community and stakeholder engagement throughout the planning process and having a community with a history of civic involvement supported the city's efforts. Additionally, the history of Collaboration that has existed in the region between municipalities and educational institutions served the city well in being able to leverage existing pathways for knowledge transfer. The history also highlighted struggles the city has faced in dealing with environmental issues that require support from the federal government. Environmental Justice was a key component of the CAP according to participants, and its inclusion has ensured marginalized voices were given a seat at the proverbial table. The issue of Political Polarization illustrated without consensus, most effective strategies might not win out. These themes are interconnected and were each discussed to some extent by all participants in the study. Each theme included issues the city, community, and individuals should consider moving forward.

Community Engagement

This study revealed bringing together a diverse audience to discuss climate action planning was important. The city used existing community norms, particularly around civic and community engagement, to leverage resources and structures that aided in the climate action planning process ultimately leading to a plan supported by the community at large. Although many public comments were from community members who regularly engaged with city council measures, the city solicited some feedback from community members who might not have

ordinarily participated by reaching them through winter storm prep meetings and anonymous surveys. This study also illustrated the city attempted to engage community members outside of the usual suspects; yet, there was room for improvement in community outreach. Part of the difficulty around engaging certain populations had to do with miscommunication and the inability of many residents to access the draft plans or know these meetings were happening.

Local and Regional Collaboration

The study also revealed the importance placed on collaboration by the city and participants. In this study participants universally recognized climate action planning struggles to be successful if governments, educational institutions, cities, and communities are not working together. Highlighted in this study was the inability to address sewage pollution in the ocean and Tijuana Estuary because the city lacks funding and jurisdictional control. Conversely, the strong collaboration that has existed between the city and research institutions is an area of strength that has been leveraged with some success and has the opportunity to be used further in the future. Although some of this collaboration was intentional, much of the collaboration was the result of Imperial Beach being home to the Tijuana Estuary, which was one of the earliest indicators of a changing climate in the southern California region, and an attractive site for climate scientists. Study participants clearly valued existing partnerships, but also saw ways to leverage them further and expressed a desire for greater sharing of information research institutions were gathering.

Environmental Justice

Environmental Justice is the idea everyone deserves the same degree of protection from environmental risk regardless of race, ethnicity, or socioeconomic status (Environmental Protection Agency, 2021) and was featured prominently in the city's climate action planning

process and LCP. Including an environmental justice component of the CAP and LCP commits the city to prioritizing groups and communities that in the past might not have had an equal voice in the planning process. It also illustrates how the city is already thinking about how to best assist community members who may be most adversely affected by climate change impacts. This component of the CAP was a direct result of the work of local nonprofits and clearly something the city was proud of and communicated. Environmental justice was discussed nearly universally by participants in this study, but most did not phrase the concept in those terms. Rather, participants referenced contributing factors to environmental injustice, such as socioeconomic stratification, lack of access to city services in certain communities, or populations might struggle to adapt without support. All participants knew the city had included the concept of environmental justice in the CAP and viewed that as a positive.

Political Polarization and Managed Retreat

Political polarization was a topic universally discussed by participants and managed retreat was viewed as the dividing line for many residents. Managed retreat is the idea protecting the beach and sensitive ecological zones is more desirable than protecting public or private property (City of Imperial Beach, 2016). As a result, some areas have to be sacrificed to the sea because protecting them is either too expensive or not possible without heroic measures. For participants in this study, the idea of managed retreat seemed to be conflated with imminent domain in the minds of community members and associated with more liberal political leanings in the minds of their more conservative neighbors. Many participants referenced individuals in the community who supported the Trump administration were much more likely to be opposed to managed retreat as an adaptation strategy. Participants cited this very vocal opposition as the

reason managed retreat, referenced as the most economically viable option in the Sea Level Rise Study (2016), was removed from the final CAP document.

Discussion of Major Findings

The major finding of this study was climate adaptation planning best assists the city, community, and residents in coping with and adapting to climate change when the approach to planning is collaborative, informed by diverse perspectives and experiences, and grounded in science. This finding tied directly back to both theoretical frameworks, pragmatism and design thinking, that guided this study. The mission of design thinking is to translate observations into insights and use those insights to improve lives (Brown & Katz, 2011). Similarly, the pragmatic philosophical movement is concerned with outcomes (Creswell & Poth, 2018), as was this research. Findings from this research may directly improve lives of residents in cities coping with climate change impacts and lead to better outcomes for coastal communities who are able to leverage and expand on these findings.

As discussed in Chapter 4, the climate action planning successes Imperial Beach has seen can be directly traced to the high level of community engagement in the process and the effort made by the city to seek out perspectives, desires, and needs of its residents to inform the plan. Though Imperial Beach's climate action planning process was not without challenges, this case study illustrated by fostering conversations, working collaboratively, and prioritizing environmental justice the City of Imperial Beach is on their way to coping with the wicked problem of climate change and its cascading impacts. The study also highlighted the challenge political polarization and poor communication created in this process.

The first iteration of the plan, the 2019 CAP, laid the groundwork for current adaptation and mitigation efforts and provided a framework for future planning. This plan will be revised in

future years and findings of this study may offer pathways and strategies to garner more support for more aggressive measures excluded from the 2019 CAP. By developing a CAP, the city hoped to be able to address worst-case scenarios should they occur, but hopefully prevent them through adaptation and mitigation measures. The stronger preventive measures the city is able to enact, the less likely it is to need drastic, heroic measures later.

Chronological Time-Series Analysis

Compiling a chronological time-series was important to this study, first and foremost, because it did not exist prior to the study and being able to lay out steps the city took in a systematic way was essential in understanding the planning process. A chronological time series also allowed me to trace events over time, which is a strength of case study method (Yin, 2014). The chronological time-series served an important analytic purpose in helping to investigate and consequently understand if participants' perception of important events did in fact play a critical role in the climate action planning process.

When this chronological time series was viewed through the lens of the pragmatic theoretical framework, it worked to outline steps the city took to arrive at the eventual outcome of a CAP. Because pragmatic theory is concerned with outcomes (Creswell & Poth, 2018), understanding what steps led to the eventual outcome, and how those steps can actually help communities to problem solve through their climate action planning process was critical to understanding the climate action planning process in the City of Imperial Beach.

Had the city not been involved with the Climate Collaborative from its inception, examining climate action impacts at a city level would have been difficult because the city lacks resources. Being able to leverage resources of a regional group, such as the San Diego Bay Sea Level Rise Study, allowed the city to gain a baseline understanding for what they could expect to

experience. In turn, this provided city employees participating in the collaborative a pathway to advocate for more focused studies on what climate change impacts could mean for Imperial Beach. This led to the city being able to apply for a grant that funded their own Sea Level Rise Study. Without this study, planning for a rising sea level and educating the community about cascading impacts would have been purely based on speculation. Sea level rise (SLR) is already a difficult topic to engage people on, without firm data it would have likely been impossible.

Community Engagement

Community Engagement was a strong theme throughout participant interviews and illustrated through document analysis. Universally, participants talked about the history of community engagement in the city. As a result of the city's history of community engagement with city projects and policy developments, the climate action planning process had natural avenues to travel that helped it develop traction. Participants discussed, historically, the city used community engagement and tapped into their resources for this planning process. Participants believed this work enhanced these community relationships; thus, positioning the community to better address climate change. Understanding the process around community engagement ties back to the pragmatic framework as well and helped to really lay out what strategies led to good outcomes. The city can leverage those processes moving forward, while addressing some challenges participants noted during this process.

Effective Mechanisms for Gaining Feedback. One area that participants universally viewed as a strength was the effort the city took to solicit feedback from the local community. It was widely acknowledged many residents took an active role in the public planning process by participating in public comment, responding to city surveys, and attending workshops. Some participants also noted efforts the city made to bring local residents who might not necessarily

have participated in the climate action planning process to the table. The following sections explore ways Imperial Beach encouraged and gathered community feedback and how those processes can be improved for future climate action planning processes.

Public Comment. Study participants felt collecting public comments in a formal fashion such as city council meetings, board and commission meetings, and workshops where the LCP, CAP, and GP were discussed were most effective. As a result of the Brown Act, meetings like this are recorded and extensive notes are taken, which ensures all data are captured. City employees who participated in this study said the most effective meetings that gave them the best information were workshops that brought city council, boards and commissions, and city staff together. This ensured everyone was getting the same information from residents to community groups, and allowed teams working on the plan to see how different parts of the plan might be in conflict with each other and address those concerns in the draft process. This finding supports the work of Agrawal (2008), Opare (2018), and Brugger and Crimmins (2015). All three studies stressed adaption is inherently a localized endeavor and if the community is not involved in the adaptation planning process it will likely not be successful.

When this finding is reflected on in terms of pragmatic theory, the value of collecting input in a formalized process flows directly from the practical application and consequences that resulted. Information collected was able to be used to influence subsequent plans and these plans helped the community problem solve, which is the goal of pragmatism. Information collected and used in the planning process ultimately shaped the final product and those final plans will improve the lived experience of Imperial Beach residents.

Surveying the Community. Participants also discussed the first survey sent out by the city. The purpose of this survey was to gauge what climate change issues most concerned

residents, which shoreline protection efforts were most supported, and what challenges local residents perceived the city to be facing. Even though the survey only captured opinions of 330 residents, admittedly a small group, it was seen as providing some data the city could use. Going forward, the city could be using more methods to get the survey out to a wider variety of community members. Taking measures to increase survey access and responses, the city may be able to collect thoughts and opinions from community members who might not otherwise engage with the climate acting planning process. Because climate change impacts are inherently disruptive to the local community, there is a need to gather information from diverse sources in that community to enable adaptation to associated challenges (Brugger & Crimmins, 2015; Opare, 2018). Hearing from diverse voices is important because, again as noted previously, adaption is inherently a localized endeavor and if the community is not involved in the adaptation planning process it will likely not be successful (Agrawal, 2008). Furthermore, a survey is a very good option for soliciting feedback from community members who may have difficulty engaging in the process in other ways.

According to participants and document analysis, this survey was not shared in places such as Imperial Beach affinity groups on Facebook, or via the city's Instagram or Twitter. It was shared via the neighborhood app, Next Door, but the post had very little engagement because it was not clear how to access the survey. These digital platforms are places city residents regularly access to share and receive information from their neighbors, so deploying the survey in places community members are already checking for information and resources will be crucial going forward to pull in data from a wider audience. This finding is another place where the frame of pragmatic theory supported the research outcomes. For Imperial Beach, and other

cities to do climate action planning well, there needs to be multiple ways for community members to provide feedback and engage with the planning process.

Engaging Local Residents. Though the city has a dedicated population of residents who engage with city planning efforts, pulling new people into the climate action planning process can be a challenge as this study illustrated. Although the city made efforts to bring new voices into the climate action planning process, they really saw mixed results for their efforts. This could be in part, as participants noted, because climate action planning can be a very technical process and residents might not think they have valuable input to contribute. Alternatively, residents might not have enough context in which to meaningfully contribute to the discussion, as one participant noted.

In one successful effort to engage community members who might fall outside the normal demographic engaged with this process, the city used community-based winter storm preparation meetings to further the climate change and adaptation planning discussion. According to participants, residents who typically attended these types of community meetings tend to be older. This older demographic is also the same group of residents who may not think about a changing climate and how it might impact the city where they live because as older participants pointed out, they are unlikely to be around to see the worst of the damage. As noted by participants and verified via document analysis, people attending winter storm prep meetings tended to live in areas already experiencing increased flooding as a result of king tide events and these areas will feel the impacts of SLR first. Participants also noted it was crucial to leverage existing pathways into these community groups because many climate adaptation measures will struggle to be approved without their support because many people who own property in areas predicted to experience the worst impacts are 65 and older.

Using existing pathways and programs also allowed the city and technical experts to leverage localized knowledge they may not have access to in any other way. This finding was also supported by the previous work of Son et al. (2019) and Agrawal (2008). These authors found using local knowledge, paired with technical expertise, can yield the best results. Additionally, Brugger and Crimmins (2015) found focusing on localized knowledge allowed groups to better connect and coordinate with their neighboring communities in adaptation planning, which drove a more successful end result. Helping people understand the technical side of climate science and how that pairs with the local knowledge they possess may prove crucial in gaining support for implementing more aggressive climate adaptation measures.

Design thinking framework can play a role in supporting these efforts too, because design thinking works to create new coalitions that bring new solutions to complex problems (Brown & Katz, 2011). Additionally, it helps to disrupt cognitive biases people subconsciously bring with them to decision-making processes. Employing design thinking when attempting to engage older residents may be particularly useful for Imperial Beach going forward.

Challenges in Community Engagement

Though the city saw successes in community engagement, they still faced several challenges. Those challenges, according to participants, included always seeing the same faces participating in public comments and difficulty engaging an aging population who viewed the worst impacts of climate change as something with which they likely will not experience. There were also significant challenges in terms of communication about the plan (and the planning process) that may have deterred potential participants.

The Usual Suspects. Despite success of the final CAP and LCP, the City of Imperial Beach faced challenges during the planning process. One issue commented on by city employees

and regular attendees of city council meetings was it was often the same people providing public comments on drafts. The city, despite their efforts to use existing city pathways, still struggled to engage new people with the formal climate action planning process in a sustained fashion. However, on avenue they leveraged successfully was winter storm prep meetings. The city hosted a wide variety of other community meetings where information could have been provided and more community members might have become engaged in the CAP process. This finding is supported by the work of Seng and Hanpachern (2018), who found when city planners used existing social organizations to approach people about the climate planning process, people were more likely to engage. Engagement through existing channels is a strategy the city could adapt for future plans.

Hahn et al. (2020) found a diverse set of stakeholders was critical for developing a climate action planning framework for the Anchorage, Alaska CAP. The authors found to cultivate a diverse participant group, the city ensured translators and easy-to-read materials were available for all outreach activities and events. Hahn et al. (2020) also found providing childcare at sessions and holding meetings and workshops near public transportation or in walkable areas was critical to bringing new people into the conversation. These simple measures made the process more accessible to many people who otherwise would not have been able to engage. Going forward, the City of Imperial Beach could consider these measures to increase engagement.

Furthermore, if the city had employed a design thinking model to engage participants in the climate action planning process, they might have seen more participation in the process from people outside of the usual suspects. According to Micheleson (2016), leveraging design thinking in community engagement encouraged participation when community members were

asked to provide solutions rather than just having information presented through one way communication. By using a design thinking model, the city may have been able to provide context for community members to meaningfully engage in the process. Micheleson (2016) also pointed out for people to be able to actively participate and offer solutions, they have to have some context for climate action planning. Participants in this study noted the city had never really been able to provide context for people to meaningfully engage, and as a result when the city was asking for comments on draft plans, most of the community was not equipped to help problem solve.

Engaging the Aging Population. Several participants discussed how it is crucial to engage the aging population in future climate action planning measures because the city was not entirely successful in engaging this population during the most recent planning process. One crucial reason to engage this population is because they own and/or reside in a large portion of the residential property on Sea Coast Drive. Sea Coast Drive, as mentioned before, is one area of Imperial Beach already experiencing climate change impacts. Additionally, many residents on Seacoast Drive are longtime residents of Imperial Beach. Their knowledge of the community, in particular as noted by Son et al. (2019), has the potential to provide context specific information for addressing climate change impacts. As Seng and Hanpachern (2018) found, using existing social groups was critical for bringing in portions of the population that had not been previously engaged. Connecting with existing community groups, particularly those made up most of older members of the population may increase engagement of members from this demographic in the climate action planning process.

Nonprofit and Community Group Participation. Community groups and nonprofits are also poised to be able to support the city in the climate action planning process because of

their specialized knowledge this study found. Some of these groups have knowledge about climate action planning, which is a resource the city can leverage. Other groups have specialized knowledge as it pertains to issues that tie directly to social and environmental justice issues specifically mentioned in the CAP of Imperial Beach. The area of expertise may be in affordable housing, needs of seniors living in the community, or food insecurity, among others, but if the city had been able to leverage their knowledge in a more structured fashion, this might have helped the city engage more participants from a wider section of the community and address existing community needs through this planning process. As the study by Pressey and Botrill (2009) found, it is necessary to develop structures that support collaborative approaches. This is one way the city could have leveraged pragmatic theory (Cornish & Gillespie, 2009) to achieve results by facilitating adaptation planning and implementation across different administrative units, jurisdictions, and communities.

Communication Mishaps. This planning process was also marked by communication challenges and mishaps. Participants nearly universally noted they struggled to find information about plans and community meetings. City staff noted this was largely the result of not having a dedicated communication person on staff whose sole responsibility was creating outreach and recruitment materials. This finding was supported by the work of Seng and Hanpachern (2018), who found developing multiple outreach methods for different groups in the city was crucial to having an engaged community and cities should add sufficient resources to improve communication about the climate action plan, because as noted by Oulahen et al (2018), a lack of public awareness creates a barrier for action in climate adaptation planning. Understanding where and why those communication challenges happened provides an opportunity for the city to

better develop a communication plan about climate action planning and community involvement moving forward.

Digital Communication Challenges. Information is shared online constantly, and a strong online presence is critical for success in a world that is largely digital. Though the city worked to share information in a digital format, most participants noted they had difficulty accessing information about climate action planning from the city webpage. The city really only used its own webpage and Facebook page to share information digitally about when community workshops would be held. As one participant pointed out, no one checks the city Facebook page for information. Had the city leveraged platforms like Instagram and TikTok, they may have seen more engagement from a younger population. Using apps like NextDoor, which is neighborhood-based and used by a wide spectrum of community members, could have been another way to engage more community members. Facebook could have been leveraged more effectively had the city posted notices into groups frequented by community members, rather than posting exclusively to their own page. One participant noted there may have been hesitancy to use these platforms because of lack of knowledge. As two other participants noted, having someone who had a better understanding of social media platforms manage digital communication would have increased access to digital communication.

As noted by West et al. (2009) and Bierbaum et al. (2013), some barriers to climate adaptation planning can be attributed to a lack of funding and institutional constraints. Both of these issues could have played into communication struggles the city experienced. Current and former city employees who participated in the study noted the city did not have a communications manager and has lacked funds to hire one. As a result, city staff do the best they can with limited resources in an area that is not their expertise. Mark commented he tried his best

to make sure information was shared, but he thought if the city was able to even hire an intern who could have handled disseminating this type of information, it would likely have increased community involvement. At the time of this dissertation, the city webpage was undergoing a redesign so hopefully this issue will not continue to be a barrier for engaging the local community.

Written Communication Challenges. The city also experienced challenges around the written communication strategy. The city released pdf files on the website and shared printed versions of these files on message boards and in community spaces in town, and placing notices in the local paper. Despite these efforts by the city, several participants struggled to access hard copies of documents and commented on how confusing the notices in the paper were. According to participants there did not seem to be a plan for where paper notices were to be regularly placed. This harkens back to studies by West et al. (2009) and Bierbaum et al. (2013), referenced in Chapter 3, which found barriers to climate action planning such as a lack of funding and institutional constraints hamper progress. Print media is expensive and as illustrated by participant comments and through document analysis, the City of Imperial Beach does not have the luxury of a substantial city budget that can easily absorb these added costs. Again, the city does not have a communications director and instead staff who are shepherding the climate action planning process are simply doing the best they can.

As one participant noted, most residents probably did not understand the notice in the paper, if they even saw it. If they did, and sought out a copy of the plan, many would not be willing to make the three trips it took Dave to get a copy. Baca et al. (2014) found enabling people to have access to resources empowers the community to shape the direction of the adaptation development. Baca et al. also asserted the decision of a community member to engage

with the planning process can provide for development of a network that could facilitate recovery after climate shocks. By increasing community engagement and creating the structure for adaptive leaders to emerge, the city may be able to increase community resilience when Imperial Beach experiences their next climate change impact event.

Interpersonal Communication Challenges. All participants discussed the struggle to have difficult conversations, particularly around politically charged topics. The city noted it developed the steering committee in an effort to avoid tense, difficult discussions around climate change and adaptation measures. Hahn et al. (2020) and Seng and Hanpachern (2018) noted steering committees are essential to successful plans, but did not note if those committees were effective in helping facilitate or avoid difficult conversations. In the case of Imperial Beach, the steering committee was not able to prevent these difficult discussions and, in actuality, the city tried to avoid having these difficult conversations. That strategy ultimately did not serve the needs of the community and complicated the climate action planning process because community members did not have the opportunity to work through these differences of opinion. The struggle around interpersonal communication is another occasion when, had the city leveraged design thinking, provided the community with more context, and an opportunity to have those difficult discussions, participants would have been more prepared to help problem solve in a meaningful productive way. The subject of interpersonal communication is an area that is ripe for more exploration and research.

Misinformation Campaigns. The climate action planning process in Imperial Beach has also been impacted by misinformation campaigns that have largely sought to politicize the climate action planning process. According to participants, the misinformation campaign focused primarily on the idea of managed retreat, not the actual planning process. Again, here it is

evident communication about climate action planning via many channels is important (Seng & Hanpachern, 2018) and allowing people access to resources is critical for success of climate action planning (Baca et al., 2014). If the city had been able to engage with more community members via their existing social networks and community groups, these groups may have been less susceptible to the misinformation campaigns. Furthermore, if accessing draft plans and supporting documents like the Sea Level Rise Study had been easier, that might have reduced the tendency of community members to conflate the practice of managed retreat with imminent domain.

The preceding section discussed community engagement and how that was successfully leveraged by the city, and where there are areas for possible improvement and more targeted, direct action. The following section explores collaborative efforts essential for climate action planning and how the city can expand those efforts going forward.

Collaboration

Collaboration was a central theme that emerged during participant interviews in this study. The City of Imperial Beach has a history of strong regional collaboration and of working with researchers to collect data that inform the decision-making and planning processes. This study also highlighted struggles the city has faced in terms of collaborating with their closest neighbor, Mexico, because of the role of the federal government in international border issues.

We Are All in This Together: Collaborative Climate Action Planning

Nearly universally, participants discussed collaboration across many levels of organizations and between groups and research institutions was key to successful drafting of a CAP. The city acknowledged climate action planning could not happen in isolation, as many aspects of climate change affect a whole region and does not stop at the city limits sign. This

finding was supported by the research of Bierbaum et al. (2013), which found community adaptation efforts require federal, state, and local agencies to coordinate their climate change adaptation planning efforts.

Additionally, adaptation measures can have impacts beyond the community where they are implemented, so an attempt to address these issues as a region is crucial and was noted in the CAP and LCP. A lack of coordination at the national, state, local, private, and nongovernmental levels, and the proliferation of often duplicative and sometimes contradictory adaptation approaches can hinder implementation of timely adaptive actions (Bierbaum et al., 2013). To work successfully at broader scales, Pressey and Botrill (2009) found it is necessary to develop government structures that support collaborative approaches. This helps to facilitate adaptation planning and implementation across different administrative units, jurisdictions, and communities.

Participants who worked for the city discussed the support they had from city administrators and city elected officials to participate in regional and national climate action planning groups. Nancy noted having these connections helped ensure the city was not just looking at their planning process through the narrow lens of what was happening in Imperial Beach without considering what was occurring in surrounding areas and how it might impact the city. It also allowed city staff to think about how their proposed solutions could impact the neighboring communities. Because neighboring communities were also discussing climate change and how to address impacts, this elevated the conversation in the City of Imperial Beach and allowed them to put forth relatively progressive climate action plans. This finding echoed findings in the work of Oulahen et al. (2018) and Smucker et al. (2020), who noted local governments were building their own local networks to address the complex challenge of climate

change. These authors found leveraging municipal government networks led to relatively progressive local policies on climate change adaptation, and comments from study participants in Imperial Beach confirmed this finding.

Participants all discussed the strong role the city council played in pushing the climate action plan forward. The city council played a crucial role in prioritizing development of a CAP, supporting city staff who managed the process, and ensuring there was funding to support advancement of climate action planning in Imperial Beach. This supports the finding from Oulahen et al. (2018) that senior political leadership is necessary in advancing climate action planning and is also an example of the city using a pragmatic framework to ensure collaboration led to productive action (Bierbaum et al., 2013). Without collaboration both at a city and regional level, the CAP process could have duplicated efforts or produced conflicting strategies for advancing climate action in the city.

Educational and Research Institution Collaborations. Nearly universally, participants discussed existing collaborations the city has with educational and research institutions located or working in the city. Imperial Beach currently uses research from SCRIPS to help inform decision making about which SLR measures to consider. But there has been little information about how or if the city drew on findings from other research being conducted in the city. Although research examining the connection between academia and government to help solve complex challenges has been limited, the work of Watanuki et al. (2019) noted bringing together academia, government, and industry can have a positive impact on problem solving. Hahn et al. (2020) found collaborative planning with a local university that prioritized community engagement could support development of a robust plan integrating local scientific expertise and was representative of the community it is serving. Han et al., theorized a framework that brings

together academia, industry, and government to solve climate adaptation challenges will produce the best solutions because of the different skill set each partner would bring to the discussion. The city leveraging the work of SCRIPPS to understand the best adaptation measures to address coastal erosion and SLR supported claims made by Watanuki et al. (2019).

There is opportunity for the city to leverage all the research and educational resources they have and there was a desire from all participants to see more of that research made public in more accessible ways and used in the climate adaptation decision making process. Having more public access to this research as participants suggested might help to increase public awareness of specific issues impacting Imperial Beach. Oulahen et al. (2018) noted one critical barrier to climate action planning is a lack of public awareness. If the city were able to leverage research more effectively it might raise public awareness about the impacts of climate change on Imperial Beach with members of the community who are not engaged. Increased public awareness, as Oulahen et al. (2018) found, can reduce barriers in the climate action planning process.

If educational institutions can provide access to education about climate change, its impacts, and what that means for Imperial Beach, the city may be able to bring people into the conversation who were not participating previously. More widespread community engagement may reduce the pressure the city council feels to always be the strongest voice for climate action in the city, as one study participant noted. That is not to say senior political support becomes less important, because it does not. However, as Oulahen et al. (2018) noted repercussions politicians might worry about may be reduced if community members who were not previously engaged, began to participate in the climate action planning process.

As Baca et al. (2014) noted, climate adaptation solutions depend on support of communities, social groups, and households. Communities are unlikely to support efforts they do

not understand. If communities can rely on educational institutions to provide access to knowledge, research, and resources, this may facilitate greater community involvement in the climate action planning process. Furthermore, Baca et al. (2014) found community members are more likely to engage with an organization that provides improved access to resources and knowledge. The resulting network could facilitate a stronger recovery after climate shocks occurred which can lead to increased community resiliency.

One tenet of pragmatic theory is knowledge is useful when it is actionable, as Kelly and Cordeiro (2020) noted. Imperial Beach has a great deal of knowledge that has been collected through partnerships with educational and research institutions. Leveraging this knowledge for action is a benefit the city has yet to be fully exercised. If the city could use this knowledge to drive action, they might be able to see faster adoption of the more aggressive climate action planning measures outlined in the CAP.

We Cannot Tackle This Without Support: Challenges in Collaboration

Despite great examples of collaboration participants have detailed throughout this study, there have still been challenges that have plagued the City of Imperial Beach in the climate action planning process. The biggest challenge in collaboration for the city was its inability to work directly with Tijuana, Mexico to address cross-border sewage pollution issues. Without support from the federal government, the city is really limited in terms of action it can take to address the pollution coming into the city. This study reaffirmed the findings of Oulahen et al. (2018), who noted collaboration between governments and levels of government is crucial for adequately addressing climate change.

Bierbaum et al. (2013) found a lack of coordination at national, state, local, private, and nongovernmental levels, and proliferation of often duplicative and sometimes contradictory

adaptation approaches can hinder implementation of timely adaptive actions. To work successfully at broader scales, Pressey and Botrill (2009) found it is necessary to develop government structures that support collaborative approaches. This helps to facilitate adaptation planning and implementation across different administrative units, jurisdictions, and communities. This finding was critical for the City of Imperial Beach as it works to address the cross-border sewage pollution issues. This issue, discussed in the next section, is complex and required not only local support, but also involvement of two federal governments.

Cross-Border Sewage Pollution. As several participants noted in their interviews, dealing with cross-border pollution is expensive and the City of Imperial Beach is not wealthy. As the SLRs, the prevalence of cross-border pollution is also expected to increase, adding to climate adaptation measures the city will need to plan for and adopt. As Mark noted, the city can work with surrounding municipalities, state, and federal partners, as well as Tijuana, Mexico to devise a solution, but without funding from the federal government, the issue will not be solved. The research of Bierbaum et al. (2013) supported this finding. The authors noted a lack of sustained multiyear funding impedes the ability of a region to advance climate action planning, implementation, and monitoring. The federal government has promised Imperial Beach money to address the cross-border pollution issue, but as West et al. (2009) and Bierbaum et al. (2013) noted, without sustained multiyear funding, it is unlikely to be effective. Furthermore, the city has not yet received funds and the current plan is not for the funding to be multiyear at the time of this dissertation being written.

Adding to the sewage pollution issue for Imperial Beach has been the fragmented jurisdictional control. The city has very little ability to address sewage pollution coming into Imperial Beach because, as noted previously, it is an issue under federal jurisdiction. Fragmented

jurisdictional control is also a critical barrier to developing adaptation strategies and resilient systems that cross jurisdictional boundaries (Bierbaum et al., 2013).

Additionally, findings of Baca et al. (2014) supported the findings of this study. The authors found adaption solutions should focus on infrastructure and support the institutions responsible for managing the issue. The sewage pollution issue is an infrastructure challenge, and the City of Imperial Beach is not being supported in their efforts to address the problem. Kalesnikaite (2019) had a similar finding, noting a positive association with a higher level of collaborative activity among government agencies. Collaboration allowed government agencies to pool their resources, which led to cross boundary collaboration, which led to more positive policy outcomes related to climate adaptation planning specifically to address SLR. If the federal government were able to provide sustained, multiyear funding and facilitate partnerships between Tijuana, Mexico and Imperial Beach, the city could likely address this issue in a timely, effective manner. Unfortunately, until this issue is resolved, Imperial Beach will continue to be an example of environmental injustice and a failing of public health agencies.

Environmental Justice

The most crucial finding in this study was acknowledgment of the need to address environmental injustice issues that exist in the City of Imperial Beach. The city included a commitment to environmental justice in the planning and implementation of the CAP and included an official statement on the matter in the final draft of the CAP and LCP. Including environmental justice in the CAP and LCP was important, because it formalized the city's desire to hear from as many constituents as possible during this process. This component helped to ensure, going forward, climate adaptation measures will consider all populations and

communities in the city and provide equal access and meaningful participation in the climate action planning process.

As noted in Chapter 2, Pattison and Kawall (2018) called for a reimagining of local climate action planning in a way that enhanced autonomy of community members. Increased autonomy among community members leads to more equitable local climate action planning that can address issues of environmental justice. The authors noted local programs and policies working to reduce greenhouse gas emissions while addressing affordability issues in the housing market attempted to address two issues at once—which is what the city is attempting to do via the CAP process. Using measures that address multiple challenges could increase the likelihood of residents feeling more empowered to engage with the public planning process. A collaborative planning process that prioritizes community engagement can help craft a planning document that not only uses scientific expertise, but is also representative of the community it is meant to serve (Hahn et al., 2020).

The solutions should support the community ties directly to the theoretical framework of design theory, which prioritizes putting people first (Brown & Katz, 2011). Centering people who are experiencing climate change impacts already is crucial to addressing these issues in a just and equitable way. It also ensures these challenges are addressed holistically, not just from a technical perspective. Blurring boundaries, design thinking helps to establish new coalitions that can solve these challenges in a dynamic way (Buchanan, 1992). Addressing challenges in a new way is essential for solving wicked problems, and centering environmental justice in these efforts will help bring novel solutions to the table.

Economic Disparity

In Imperial Beach, the catalyst for addressing environmental justice in the CAP and LCP was the economic disparity that exists in the community. As participants pointed out, there might be a million-dollar home beside a lower income multifamily housing complex, or may be seniors who live on a fixed income, who cannot afford to fortify their homes against climate impacts. Because the city was cognizant of these challenges going into the climate action planning process, they could prepare to address these issues moving forward, as Anna (a study participant and elected official) noted.

Though academic research exploring the connection between climate action planning and environmental justice considerations has been limited, the work of Pattison and Kawall (2018) supported the findings of this study. Pattison and Kawall argued policies that directly worked to reduce greenhouse gas emission while attempting to address housing affordability can increase environmental justice through the climate action planning process. Three participants specifically discussed the issue of affordable housing and the connection housing has to environmental justice efforts in Imperial Beach. Affordable housing close to public transportation was one of the CAP measures Imperial Beach was planning to use to reduce greenhouse gas emissions associated with transportation.

Additionally, as stated in the LCP, environmental justice "is achieved when everyone has equal access to, and meaningful participation in, the decision-making process to have a healthy environment in which to live, learn, and work" (City of Imperial Beach, 2019a, p. L-17). As Pattison and Kawall (2018) noted, communities in which climate action planning had an environmental justice component led residents to have more autonomy. Therefore, residents might become more empowered and more likely to engage in the decision-making process that

directly impacts their community. City staff and officials who participated in this study all commented on wanting to be able to engage sections of the community who are not currently engaged, and the environmental justice component of the current CAP and LCP may provide them the ability to do that.

Political Polarization

A persistent challenge in the climate adaptation planning process of Imperial Beach has been political polarization. Political polarization in Imperial Beach around the climate action planning process was rooted in one of the adaptive strategies, managed retreat. Participants in this study explained managed retreat was conflated with the idea of imminent domain and a small, but vocal, portion of citizens repeatedly appeared before the city council to advocate against using this strategy for climate adaptation in Imperial Beach. This small but vocal group also engaged in a misinformation campaign that tied managed retreat to policies more often perceived to be favored by more progressive politics, like imminent domain, despite the concepts being unrelated. Unfortunately, despite climate change being a politically charged topic, there has not been much research about the connection and/or tension between climate action planning and politics.

Do Not Use THAT Word: Managed Retreat

As demonstrated in Chapter 4, the political polarization that stymied parts of the planning process was rooted in the concept of managed retreat. Nearly universally, participants classified the group opposed to the idea of managed retreat as politically conservative, proponents of individual property rights, and climate change deniers. This group regularly attended city council meetings, CAP workshops, and wrote letters to the council. Participants noted this group was

able to effectively shut down the city council's efforts to bring managed retreat, the most economical strategy for climate adaptation in Imperial Beach, into the CAP and LCP.

As one participant noted, city council members know managed retreat is the best option, but they do not want to deal with the political backlash it might bring with it. Oulahen et al. (2018) found voters reward politicians for responding to disasters, not for investing in preparedness. Therefore, the incentive for local leaders to divert tax dollars toward something the public does not support is politically risky. This proved to be the case in Imperial Beach, at least for this version of the CAP and LCP, and the concept of managed retreat was removed. If, in the future, the city could leverage principles of design thinking—particularly as they relate to examining new situations—they might be able to help individual decision makers reduce their cognitive biases and improve climate planning outcomes for the city (Liedtka, 2014). If used effectively, in future years, the council may have the support needed to make managed retreat a strategy the city pursues; however, that will likely be largely dependent on the city's ability to educate and communicate about what managed retreat would mean for Imperial Beach specifically.

Preserving the Status Quo

As Mark noted when discussing managed retreat, options for preserving the status quo in Imperial Beach were not very good, and many things the city has tried in an effort to mitigate damage from SLR and increased storm surges has not worked. In reality, one thing that might actually allow the city to preserve the small beach town vibe participants and documents frequently referenced might be managed retreat.

Again, as Oulahan et al. (2018) found, politicians are reluctant to divert funds away from present day needs in favor of preventative measures, but they also have to consider the economic

impact that can have on the community. A strategy of managed retreat can cause businesses to choose to invest in other cities and harm the real estate market, and this is a particular concern in Imperial Beach because of the city council's focus on economic revitalization. The city is not wealthy and is dependent on tourism dollars. Without a thriving beach area, many of those dollars go away and will further limit the tax base of the city. This in turn will further limit the climate action planning the city is able to do. Additionally, a strategy of managed retreat may open the city up to lawsuits it simply does not have money to fight. The current city council had to weigh options as they considered the path forward and opted to remove managed retreat in favor of temporality preserving the status quo.

When the conflict around managed retreat is viewed through the theoretical framework of pragmatic theory, it is not surprising the city removed the subject from the final plan, because pragmatic theory is concerned with what works (Creswell & Poth, 2018), and in Imperial Beach the idea of managed retreat was not working. The city's priority was to pass a climate action plan, even if it was not perfect. Removing managed retreat allowed their plan to be passed. Pragmatic theory also evaluates beliefs and theories based on how adequately they allow individuals to interact with the world and practical implications of those beliefs (York, 2009). Refusing to consider managed retreat in the menu of options for climate planning in Imperial Beach will not help in allowing people to adequately and fairly solve their problems. The following section discusses the framework for complexity leadership theory (CLT), and how the city has already benefited from some elements of the framework and ways the city could use the framework going forward.

Discussion of Findings Related to CLT

The framework of CLT was discussed in Chapter 2 of this dissertation. As noted there, findings of this study were viewed through the lens of CLT in an effort to further understand what measures work in the climate action planning process. This theory combines adaptive, administrative, and enabling leadership to create a leadership framework that enables the learning, creative, and adaptive capacity of complex adaptive systems (CAS) in knowledge producing organizations and groups (Uhl-Bien et al., 2007). The following sections will explore ways the city used CLT effectively, and where opportunity exists for Imperial Beach to further leverage this framework.

Community Engagement

The city's use of public comment is a time when CLT was leveraged well during the climate action planning process in Imperial Beach. Administrative leadership is responsible for the strategic planning and coordination portion of CLT (Uhl-Bien et al., 2007) and played a crucial role in data collection. The data from public comments could not have been collected without administrative leaders managing this part of the process. It was clear from participants' comments responsibility for collecting comments was not tied to a single person from the city, but instead was supported by existing city policies and processes.

Adaptive leadership was also at work during public comment, as both individuals and groups worked to address the challenge of adapting to climate change impacts. As Heifetz and Laurie (2001) noted, individuals act as leaders when they mobilize people to seize new opportunities and tackle tough problems. Anna, a city council member, even stated she purposely avoided certain meetings because she did not want to be seen as taking over the public process or influencing information that might be collected. By purposely avoiding certain events, Anna

hoped truer feelings and thoughts would emerge from participants and people may leverage their differing skills, knowledge, and experiences, which would help the city craft a better plan.

The city's use of a survey provided an opportunity for administrative leadership to flourish as part of CLT. Though there was certainly room for improvement in how the survey was deployed and shared, this was a good start in connecting people to the climate action planning process who might not be able to engage in the process in other ways. Additionally, data collected could be used by adaptive leaders operating in the CAP process to understand where productive disequilibrium might be used more effectively to surface tensions around managed retreat and actually resolve some of the issues surrounding that strategy. Being able to help the community process divisive feelings on the issue may enable the city to use that strategy going forward.

Engaging local residents provides another opportunity for the city to view the climate action planning process through the lens of CLT. The topic of engaging local residents required all three levers of CLT to be functioning well. Administrative leaders, the City Council in this case, set the vision for the CAP. Although the City Council set the vision for the CAP, they were not necessarily charged with developing strategies that make up the plan. A critical part of the CAP, as outlined by the council, was the focus on environmental justice. Because community members living on Sea Coast Drive are likely to be impacted first, and 30% of those living in that area live at or below the poverty line, engaging this group better in future planning processes is a crucial piece of the environmental justice component of the city's plan.

It is important for enabling leaders to find ways to engage this population in the climate action planning process. If this population is successfully engaged, the opportunity for adaptive leadership to arise from in this community is also increased. Because adaptive leaders are able to

help people adjust their expectations while promoting their resourcefulness (Heifetz et al., 2009), having that arise from within the community may help reduce the gap between people's values (e.g., maintaining their home) and the reality (e.g., climate impacts) they are facing. As a result, emphasis placed on stakeholder engagement in the problem-solving process becomes a powerful mobilizing factor for people and organizational units that have different needs, priorities, and perspectives. If the city can view the climate action and adaptation planning process through a CLT lens, leveraging each part of the framework, they may find the city has more ways of thinking about challenges and how to address them.

When looking at community engagement via the lens of CLT, it is evident the city faced challenges. Specifically, the city will need to spend some time thinking about a coordinated strategy to include existing organizations, groups, and programs to bring a wider spectrum of people to the planning table. The city already has people in administrative positions in other organizations in the community who could be leveraged to engage the community outside of the usual suspects. Creative partnerships between the library and a local nonprofit to host a book club or movie night that could surface topics of climate change impacts in a way that is accessible to more community members may do more in advancing climate action planning in the community than encouraging people to go to a city council meeting. This may also allow individuals who possess a useful skill set to emerge naturally from within the community. As noted in the section on administrative leadership in Chapter 2, this may help the city arrive at better solutions more quickly.

It is also important to think about how to engage the nonprofit sector in a more holistic way in the planning process. Had the enabling leaders in a CLT framework been able to smooth the organization-to-innovation interface Dougherty and Hardy (1996) discussed, the city might

have been able to foster interaction and interdependence between existing networks and injecting tensions that help to stimulate the dynamic that will result in adaptive change (Uhl-Bien et al., 2007). This might have helped the city have those difficult conversations they just did not seem to be able to have. The city seemed to try to avoid difficult conversations by having a steering committee vet possible options and remove the items likely to surface conflict from the menu of climate adaptation options.

In reality, the steering committee was not able to prevent these difficult discussions, but the city was also not prepared to help the community members have conversations in a way that could lead to any resolution around strategies with which not everyone agreed. This becomes more understandable when we view this part of the process via the lens of adaptive leadership. As noted in Chapter 2, the challenge of adaptive leadership within CLT is it requires people to learn how to address conflicts in values people hold and reduce the gap between values people hold and the reality they are facing (Heifetz, 1995). This city, as a collective, values their sleepy beach town community feeling, but has different views on how that should be preserved. Through exposure of orchestrated conflict, adaptive leadership can help to change beliefs and behaviors (Heifetz, 1995). The city never planned for orchestrated conflict, and in fact, planned to avoid conflict. If the city intentionally exposed the community to conflict, they might have been able to leverage that conflict to mobilize people and organizations to learn in new ways to address the challenge of climate change adaptation more completely.

If the city could have used this process to guide groups through goal setting and strategy development it might have allowed not only for an understanding of how the goal of the climate adaptation process represents the values of the community, but also whether or not the goal of climate adaptation could mobilize people to face tough realities, rather than avoid them.

Adaptive leadership has the ability to address challenges around climate change adaptation in an emergent, interactive, nonlinear dynamic that produces adaptive outcomes in social systems (Heifetz et al., 2009), if the city could leverage the principles. As Heifetz et al. (2009) stated the pressure from disequilibrium has to be strong enough to move people outside of their comfort zone, but it cannot be so great it paralyzes stakeholders and prevents action. The city never gave participants the opportunity to move past paralysis.

Collaboration

Collaboration was a central theme that emerged during participant interviews and document analysis in this study, and it was clear the city has a strong history of regional collaboration both with local governments and educational institutions. The city itself noted in the CAP and LCP climate adaptation planning did not stop at the city limits and must be viewed at a regional level, even as individual cities make their plans. Bierbaum et al. (2013) and Pressey and Botrill (2009) determined it is necessary to develop government structures that support collaborative approaches and reduce duplicative and sometimes contradictory adaptation approaches that can hinder implementation of timely adaptive actions. CLT, via the administrative and enabling function of this framework (Uhl-Bien et al., 2007), can help the city facilitate adaptation planning and implementation across different administrative units, jurisdictions, and communities. If administrative leaders, in this instance, City Council members, continue to prioritize collaboration building, enabling leaders (i.e., city staff) will continue to stay engaged with the climate action planning process on a regional level. Collaboration efforts ensure the cities that make up the southern California region are not enacting plans and policies that work against each other.

It is also important to think about how the city and region can be viewed as CAS and what that can mean for using CLT to further climate action planning in Imperial Beach and the region as a whole. CAS, as explained by Uhl-Bien et al. (2007), are the basic units of analysis in complexity science, and are understood to operate like neural networks. These networks are independent, but active, cooperative, agents who share a common goal, outlook, or need. CAS have changeable structures and overlapping hierarchies that emerge naturally within social systems (Holland, 2006). CLT allows for bringing in the "messiness, the back-and-forth, the reality" (Finkelstein, 2009, p. 77) into the leadership discussion by considering leadership within the framework of complex adaptive systems. Because CLT allows for messiness, overlap, back-and-forth, the reality of how engagement really happens, and how decisions are made in a complex adaptive system, the framework allows for a better understanding of the nonlinear path of climate action planning.

Because working in a CAS can be difficult, Uhl-Bien et al. (2007) noted enabling leadership helps manage the "entanglement between administrative and adaptive leadership by fostering enabling conditions and managing the innovation-to-organization interface" (p. 306) across and within people and actions. When everyone is working to solve a problem, the best results rise to the top if there is an enabling leadership structure that allows it to actually happen. Leveraging this structure may have benefits for the adaptive leadership model because if the formal leader supports this framework for decision making, leaders from different areas of the community who possess expertise or technical skill may feel more comfortable rising up and sharing their knowledge. This will help the community learn faster and arrive at better solutions more quickly.

Furthermore, because many cities in the San Diego region are working to address the emergent event of climate change, collaboration among these administrations is important. When leadership is no longer tied to a particular individual, but is linked to an event, leaders can emerge from all organizational levels (Uhl-Bien et al., 2007). Leadership is no longer the result of bureaucracy, but rather the result of interactions among systems. CLT can help to foster the interactive spaces between people and ideas and across whole systems, so the right individuals become leaders, or followers based on what is required and what knowledge, expertise, and experience they bring to the situation. When Imperial Beach, and the region in which it exists, is understood as a system the whole space opens up for new system dynamics that enable structures to produce outcomes (Uhl-Bien et al., 2007). As a result, the city can benefit from using this framework to foster productive outcomes not only for Imperial Beach, but for the region.

Despite successful collaborations in the city and throughout the region, Imperial Beach struggles to adequately address the cross-border pollution issue it frequently experiences. As one participant pointed out, the city can work with local, state, federal, and Mexican governmental partners, but until there are funds to fix infrastructure issues, the situation will not improve. All participants discussed the strong role the city council had played in pushing the climate action plan forward, which supported the finding from Oulahen et al. (2018) that indicated senior political leadership is necessary in advancing climate action planning. Senior leadership is necessary for addressing the cross-border pollution issue because they are often better able to facilitate across jurisdictions and as administrative leaders in the framework of CLT can set strategic vision and support city staff who are tasked with developing the plan.

Though the CLT framework might not be able to magically generate needed funds, the structure can enhance the likelihood of a solution being devised and funds being deployed. If the

administrative leaders at the city council level, county level, and state level can continue to set the strategy priority of finding a resolution to this issue, that keeps the door open for enabling leaders in the local governments to keep the discussion going. Having administrative leaders advocate for a solution in this area also opens up the opportunity to bring in people with appropriate expertise and experience to solve this issue

Environmental Justice

Imperial Beach included a commitment to environmental justice in the final 2019 draft of the CAP and LCP. A commitment to environmental justice ensures the city will provide equal access to the climate planning process and meaningful participation in it for all community members going forward. Because adaptive leadership can arise from anywhere within a social system and does not need to be associated with formal authority or position (Lichtenstein et al., 2006), having a commitment to engage with communities using an environmental justice framework allows for leadership to arise from communities often left out of city planning processes. By making a commitment to environmental justice in climate action planning, the city is using the CLT framework and laying the groundwork to create heterogeneity in future CAP processes. It bears repeating community members living on Sea Coast Drive are likely to be impacted first, and 30% of those living in that area live at or below the poverty line, engaging this group better in future planning processes is a crucial piece of the environmental justice component of the city's plan.

It is important for enabling leaders to find ways to engage the population of Imperial Beach in the climate action planning process and they are uniquely positioned to facilitate the sharing of information between administrative and adaptive leaders given their knowledge of the local population and proximity to impacts of climate change and the effect they have on the

community (Dannenberg et al., 2019; Sheehan & Rayner, 2017). Having new and different knowledge flow through the group is essential for helping change perspectives and viewpoints, and for learning new values and ways of being. If this population is successfully engaged, the opportunity for adaptive leadership to arise from within this community is also increased. Because adaptive leaders are able to help people adjust their expectations while promoting their resourcefulness (Heifetz et al., 2009), having that person/those people arise from within the community may help reduce the gap between people's values (e.g., maintaining their home) and the reality (e.g., climate impacts) they are facing.

As a result, emphasis placed on stakeholder engagement in the problem-solving process becomes a powerful mobilizing factor for people and organizational units with different needs, priorities, and perspectives. If the city can view the climate action and adaptation planning process through a CLT lens, leveraging each part of the framework, they may find the city has more ways of thinking about challenges and how to address them. Additionally, when enabling leaders within the CLT framework prioritize participation from a diverse group of constituents, this can foster heterogeneity by creating an atmosphere that tolerates dissent and divergent perspectives, which leads to better organizational outcomes (Heifetz & Laurie, 2001). Additionally, enabling leaders in this process are able to recognize the consensus that may result from a lack of diversity in the group and bring other people and perspectives into the dynamic as necessary (Lencioni, 2012).

Although Imperial Beach did successfully engage the community in climate action planning, the outreach was not targeted at specific communities or groups, or around specific interests such as transportation or housing. Affordable housing and access to reliable public transit are both issues that disproportionately impact low-income members of the community and

were cited as reasons to include a commitment to environmental justice in the CAP and LCP. The environmental justice component of Imperial Beach's CAP and LCP was brought forth primarily due to nonprofits raising concerns about the economic disparity existing in the small community and how that will affect individuals' ability to adapt to climate impacts. As participants stated, investing in energy efficient affordable housing that is close to public transit or in walkable areas has the potential to reduce greenhouse gas emissions, a key component of climate action planning, and reduce community inequity.

As Bardsley (2015) determined, system transitions need to occur "in situ" to ensure people are not entrenched in places where systems are failing. Here again it is important enabling leaders in the city prioritize bringing together a diversity of viewpoints and perspectives while providing space for adaptive leaders who can help the community learn and adapt together. Without leaders coming from diverse perspectives, adaptive challenges will not be adequately addressed (Díaz-Fernández et al., 2020). It is important to recognize for many community members the lack of formal leadership authority can cause individuals not to step into those informal roles because it might mean challenging authority and expectations of traditional leaders. As Lichtenstein et al. (2006) noted, at different times individuals may find themselves serving as leaders, and at other times as followers, depending on what is required and what knowledge, experience, and expertise they bring to the situation.

One critical piece of this climate action plan is thinking about how to solve multiple problems at once. By centering environmental justice in this plan, the city now has the opportunity to organize outcomes that are more equitable for all community members and tie to the vision and mission of the CAP. Centering environmental justice should mean the city can provide more affordable housing, which is energy efficient and located near public transportation

because doing so will help address the stated CAP goals in an equitable and environmentally responsible way. If the city is able to adopt this framework, they may see new individuals and groups mobilized to seize new opportunities and tackle the tough problems the city is facing.

Political Polarization

Political Polarization was a central theme in the climate action planning process, and certainly an area where more research is needed, but when the CLT framework is used to view political polarization, it is evident opportunity exists to use that tension to help the community catalyze the decision-making process. A central piece of CLT is the productive disequilibrium arising from adaptive leadership. Though there was disequilibrium in Imperial Beach around the idea of managed retreat, it was never productive. Rather, discussion around managed retreat ground to a halt and never had the opportunity to move people outside their comfort zone because it paralyzed stakeholders in a way that prevented action (Heifetz et al., 2009). As Heifetz et al. (2009) noted, pressure from disequilibrium has to be strong enough to move people outside of their comfort zone, but it cannot be so great it paralyzes stakeholders and prevents action.

If the city had been able to adopt the CLT framework and leverage productive disequilibrium and tension, the city might have been able to engage in the hard discussion around managed retreat in a way that moved the idea forward. As Lichtenstein et al. (2006) found, the tension that arises in the agent (i.e., the community) results in interactions that can function as a core driver for change in CLT. The city was never able to capitalize on this tension to drive decision making because the community has not internalized the change. The community is still treating an adaptive challenge like a technical challenge and there does not seem to be anyone helping the community realize some of their expectations are not realistic, and in fact are in

conflict with each other. For example, many community members favor a sea wall and a thriving sea beach. Unfortunately, a sea wall that protects property will erase a beach.

Heifetz et al. (2009) stated productive disequilibrium can catalyze the decision process and produce tension that moves people outside of their comfort zone. Adaptive leadership can then use this tension to address complex challenges in ways that produce new patterns of understanding and behavior, which ultimately break down cognitive biases about which design thinking cautions. Instead, what happened in Imperial Beach was individuals resisted the idea of managed retreat as a possible solution because their availability bias would not allow them to imagine what a more novel solution could look like (Liedtka, 2014). Sirkin et al. (2005) theorized people resist initiatives when they feel as though they did not have sufficient input in shaping the solution. Despite the city's efforts to solicit input on all strategies, there was clearly a breakdown that occurred around the idea of managed retreat.

It is important to consider managed retreat is a very different strategy than anything the city has considered before, and as Sirkin et al. (2005) noted, the greater the change, the greater amount of new learning required and the more resistance leaders are likely to face. As a result, perceived risk can become so great it paralyzes stakeholders and prevents action (Heifetz et al., 2009), but for the group to move forward, adaptive leaders must help groups and individuals internalize the change and assist them with adjusting unrealistic expectations (Heifetz & Linsky, 2017).

Using the CLT framework in planned and strategic fashion may allow the city to help residents and constituents engage with the climate action planning process more fully. Adaptive capacity is crucial to addressing climate change impacts, and the framework of CLT may hasten required changes to values, beliefs, and relationships that must occur across organization

boundaries for it to happen effectively. If the city is able to use this framework, they may see individuals and groups mobilized to seize new opportunities and tackle tough problems the city is facing as a result of climate change.

Implications

In considering implications of this study, it is important to reflect on the theoretical frames that guided it, pragmatism and design theory. Pragmatic theory is concerned with outcomes; it espouses truth and value are determined by practical application (O'Leary, 2007) and knowledge is useful when it helps people problem solve (Cornish & Gillespie, 2009). This research was ultimately about understanding what worked when it came to climate action planning. Knowledge gained through this study will help cities, communities, and individuals interact with the climate action planning process and help these groups adequately and fairly solve challenges climate change is presenting in communities.

Because pragmatism seeks to understand complex everyday experiences, it brings together the environment, memories, reactions to physical conditions, interests, limitations, and things envisioned. As a result, experiences do not reside in a person or situation, but in the space between the two. Climate action planning does not reside in one single situation or the singular experience of one individual. It is made up of complex interactions supported and facilitated by administrative, enabling, and adaptive leaders that occur in a variety of situations and formats. It is the compilation of all these experiences and things imagined that make up the process of climate action planning and leads to its success or failure. Understanding experiences the community valued and engaged with was critical in knowing what worked in the climate action planning process of Imperial Beach.

Similarly, design theory strives to translate observations into insights, and to use those insights to improve lives (Brown & Katz, 2011). The design theory theoretical framework provided a solutions-based approach (Buchanan, 1992) and was critical in understanding how the city dealt with the wicked problem of a changing climate. Imperial Beach recognized addressing climate change in their city was not going to be addressed through a single solution, which is where having a CAP, LCP, and GP became important. Despite the city's efforts, they missed out on a critical piece of design theory; centering people who have a lived experience relevant to the wicked problem they were trying to address. The city did not go to communities and populations most impacted by climate change and bring them in as active participants in the process, despite their stated environmental justice objectives. Though the city did not keep any communities from being a part of the planning process, they relied more heavily on engineers producing socially acceptable results rather than asking the impacted population what solutions they could envision.

Cities able to unleash the principles of design thinking in their climate action planning process stand to gain better solutions because it may help individual decision makers reduce their cognitive bias. This research showed cognitive bias impacted certain parties involved in the climate action planning process. Availability bias played a role in the minds of individuals who were opposed to managed retreat. Because they could not easily imagine what managed retreat could look like for their city, they undervalued the idea in favor of ideas that could be easily imagined (e.g., seawalls and infrastructure). This reaction in one population in the city resulted in the council and city government falling into the planning fallacy of cognitive bias. The city is now overcommitted to inferior ideas (e.g., sand replenishment) they know will be expensive and not a viable long-term solution. Had design thinking been unleashed, new possibilities could

have been explored, which may have resulted in new choices and new solutions to address climate change impacts in Imperial Beach.

Practical Implication and Recommendations

This study highlighted, though not perfect, the process the city engaged in to complete the CAP was viewed largely as a success. The city used a variety of mechanisms to collect feedback during this process and other communities can use this study as an example for how to begin thinking about their own climate action planning process. Key in helping other communities understand the process is the timeline compiled as part of this research. Additionally, knowing how to identify and leverage existing community norms, communicate effectively, develop regional collaboration opportunities, and leverage research institutions may help other communities arrive at a CAP more quickly than they otherwise would have.

Critically important in this study was the focus Imperial Beach placed on environmental justice as part of the CAP, LCP, and all future plans. As communities work to address climate change impacts, it is important to recognize where areas of environmental injustice exist in the community and how the planning process can prioritize projects and policies, which can work to increase equity in cities. Using the CAP, LCP, and GP to decrease economic disparity and increase environmental justice can make the community as a whole more adaptive and resilient in the face of climate change impacts.

This study revealed the city did not plan for how to address conflict. In the future, having a plan for how to surface and work through conflict may lead to better outcomes. If the city had spent time surfacing some of the conflict rooted in managed retreat, the most economically feasible option for the city might have made it into the final plan, even just a consideration for the future. Instead, the city planned to avoid any possible conflict by having the steering

committee vet the proposed CAP measures. If the process of how the steering committee arrived at proposed measures was more transparent, the discussion around managed retreat might have been more productive. The city might benefit from bringing in a conflict resolution specialist or a mediator to facilitate these conversations in the future.

Collaboration was a key finding with implications for the future. Climate change impacts will be varied and wide-reaching, and using the research already happening in Imperial Beach more effectively may help the city plan for and address those impacts. Strengthening partnerships with educational institutions, nongovernmental organizations, and local nonprofits will allow the city to capitalize on existing community strengths. Had the city been able to better use all research occurring in the city and surrounding region as an educational tool, the managed retreat argument might have been viewed apolitically and met less resistance.

Although this process can be used as a guide for other communities undertaking a CAP process, there are areas for improvement Imperial Beach, and other communities, can learn from going forward. Participants acknowledged the city made efforts to engage a wide spectrum of the community in the CAP process, but they noted efforts often fell short. These failing efforts were largely rooted in communication challenges that could have been avoided had the city hired a social media intern or better used neighborhood communication channels. If the city had been able to avoid those communication struggles, including more aggressive climate action strategies in the final draft of the CAP might have been possible.

Future Implications

Future implications of this study are largely pragmatic and communities should look to this study to understand what worked and what did not for the in their climate action planning process. This study has the possibility of serving as a guidepost for other communities working

on climate adaptation planning. As a case study, the sample size for interviews was small, but coupled with the document analysis, findings are important for Imperial Beach as the city moves forward with its climate action planning and implementation, and for other cities grappling with issues of community engagement, environmental justice, and polarization over strategies. For Imperial Beach going forward, and other groups, cities, or regions engaging in a climate action planning process, using CLT to create an atmosphere where diversity is respected and interaction of diverse perspectives is prioritized (Uhl-Bien et al., 2007) may increase acceptance of ideas like managed retreat, which are currently not palatable.

Going forward, findings of this study indicated the city could set up a process that formally invites local nonprofits to be part of the steering committee or planning group. There should also be a formal mechanism for sharing research being done in Imperial Beach with the city and community. Such a mechanism could be a powerful decision making and educational tool the city could use going forward.

The website has come a long way, but a portion should be dedicated to educating the community about climate change and why climate action planning is so important to Imperial Beach. The city should use communication platforms community members frequent. The city relied heavily on Facebook for digital communication, and on road signs and paper fliers. This was not terribly effective and asked people to do additional work to find information. Using platforms like TikTok, Instagram, and NextDoor may yield a more diverse group who engage with the climate action planning process. Additionally, providing a wider variety of ways for people to engage with the CAP process may yield greater involvement from the community. A few ways to do that include allowing people to submit commits directly via the website, Facebook, Instagram, NextDoor, and other platforms, which was currently not offered.

When the third research question, "*How important was having an engaged community in this process?"* is considered, it is helpful to reflect on the distinction between engagement and participation. As noted by Lodewijckx (2020), the idea of engagement is people should have some power over decisions affecting their lives. In addition to the idea that engagement is active, intentional dialogue between the community and public officials as part of the decision-making process. An engaged public was critical to the success of this CAP, but the city fell short in providing tools and information so more community members could be engaged in an intentional way. The city should use the CLT framework now in an effort to begin to build capacity of the community to engage in the decision-making process, rather than just participate in a superficial way. This effort will enable community members to step into leadership roles and engage in difficult conversations with people holding diverse views. This will help move the CAP process forward and strengthen community bonds and networks.

Discussion of Limitations

It is important to note limitations of this study. There were no participants who joined in this study who were not in favor of the CAP. Numerous attempts to engage community members who were not in favor of the plan were made via social media, but they were not successful. Community connections via study participants with members of the community who were actively opposed to managed retreat was not possible because these two groups were not friendly.

Additionally, I was also not able to engage any community members who had not been involved in the climate action planning process. Therefore, this study is limited in understanding barriers that prevented certain populations from engaging in this CAP process. This study was also impacted because of the COVID-19 pandemic. I was limited to only attending events

virtually; therefore, connecting with individuals was generally more difficult during this time than it might have otherwise been. Had I been able to attend events in person, this might have opened communication channels and allowed for recruitment of individuals who were not in favor of managed retreat and/or climate action planning, or who were unaware it had been happening.

Areas of Future Research

I hope to be able continue the research partnerships I have developed with the Imperial Beach community. Continuing to learn from and work with this community as they implement their CAP and draft future plans will be important for my future research into the ongoing CAP process. By their nature, CAPs are not stagnant and continuing to research best practices for community engagement will be important. Of particular interest will be research on how to engage community members who had not been active participants in the climate action planning process. Understanding why they did not engage with the CAP process will be useful in gaining more engagement with future planning efforts.

It will also be important to explore the connection and/or tension around climate action planning and political ideology. Politics and political affiliation came up in every participant interview, but there has been limited research on the connection between politics and climate action planning on a city level. Understanding the political divide around climate action planning will help communities' better address conflicting viewpoints and hopefully arrive at strategies that are the most economically feasible and provide the best outcomes for the community.

This research lays the groundwork to develop a conceptual framework that outlines the climate action planning process in the future. Having a model that aids communities in the climate action planning process will be important for helping advance how communities around

the world respond to projected climate impacts. Climate action planning is complex and many communities do not have resources, technical expertise, and experience to tackle it effectively the first time they begin to work on a CAP. A conceptual model could be especially helpful to these communities.

Final Reflections

The City has done a commendable job through this climate action planning process, despite challenges and setbacks the city experienced. There are few guideposts along this path because climate action planning is a relatively new concept and very few studies exist on the how-to aspect of climate action planning. It is especially challenging for small cities with limited funding. Given the small size of the city, limited city staff available to support this project, and community division around some proposed solutions, what Imperial Beach has accomplished should be celebrated. That being said, there are lessons, both for Imperial Beach and other communities, to take going forward to avoid pitfalls and hopefully smooth the path for future climate action planning processes. Climate action planning does not happen in a vacuum and it is truly successful when it is collaborative and inclusive. Individual citizens of Imperial Beach have no ability to stop streets of their town from turning into rivers during king tides and storm surges; but as a community they do have the ability to begin implementing adaptation strategies that will yield the best long-term results for their city and help them best cope with SLR.

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APPENDIX A: INTERVIEW GUIDE

Thank you for agreeing to participate in this research study. I am interested in learning about the ways your community copes with the impacts of climate change. I am hoping you will talk to me about the impacts you have experienced personally, impacts you have heard about, and impacts you are anticipating having to deal with. I hope you will answer questions about the city planning of climate change adaptation, community leadership, and what action(s) has helped the community to cope with climate change, and adapt and build resilience. I also hope you will also talk to me about how a changing climate may have affected the culture and institutions here.

Background information

Can you share a bit about yourself with me?

Probe: What is your name?

Probe: How old are you?

Probe: Can you share with me about your background? Where were you born? Where do you live now? Have you always lived on/in Imperial Beach? What about other members of your family? Do they still live here?

Probe: What is your role in your family? Parent? Child? Older? Younger?

Probe: What is your role in the community? Do you have a formal position? Are you a community activist? Informed vocal citizen?

Climate

Do you have personal experiences with climate change? If so, what are they and how have they affected you?

Probe: What do you think when you hear the words “climate change?”

Probe: Has climate change affected you? Or your community? Can you talk a bit about your personal experiences/observations of climate change impacts?

Probe: What were the first impact(s) you noticed?

Probe: In what way does climate change affect Imperial Beach? How does the climate/climate change influence your life? Does it influence your life?

Probe: How do these impacts make you feel?

Probe: Do you remember when you first heard about climate change? What do you remember thinking when you heard about climate change?

Probe: What does climate change mean to you now? Why do you feel that way?

Probe: What is your understanding of climate change and its impacts on Imperial Beach?

Probe: Do you have any concerns about climate change and its impacts?

Probe: When did you first start noticing climate change impacts or climate shocks?

Probe: Have you noticed any media coverage of climate change? What have you noticed about the media coverage of climate change?

Community

What are the challenges facing the community because of climate change impacts?

Probe: Has the community come together to address climate change impacts? How so?

Probe: Is there a demand from the community for resources to address climate change? If so, what resources are being requested? Have any been provided? Why or why not?

Probe: Is there a demand in the community for information about climate change? How does the community respond to information about climate change?

Did your community receive any outside assistance for climate change adaptation?

Probe: Did your community receive money or programs from the government (that you know of)?

Probe: If so, what was the money for, and what activities were carried out due to this assistance?

Probe: Were the activities designed by the city/state government or NGO? Are they similar or different to the kinds of development activities a community would do on your own? Why were these activities useful for addressing climate change impacts, or not?

Probe: How do you fund these programs and adaptations? Did your community receive money/grants from any organizations? If so, what was the money for, and what activities were carried out due to this assistance? Was it valuable?

Organizational Structures/Services/Systems

Are any structures/systems available to assist people in coping with climate change?

Probe: How has the existing infrastructure (NGOs, local, state, national government,) influenced or shaped the response to climate change? Why has this infrastructure been useful, or not?

Probe: How have the political institutions influenced or shaped the response to climate change? Why have these political institutions been useful, or not?

Probe: Have educational systems influenced or shaped the response to climate change? Why were these educational systems useful, or not?

Leadership Framework

How has the local leaders helped you and your community cope with climate change?

Probe: Do you have experience with the working with the city to address local climate change issues? If so, what was your experience like?

Probe: How does your community decide which adaptation strategies to utilize? Do you agree with those decisions?

Probe: Can you provide specific examples of how the city plan has helped your community? How did your community decide which projects to do?

Probe: How did the city collect the information you needed to make your decisions?

Probe: How did you build support for this process? How do you continue to maintain commitment to the decisions and projects you selected?

Leadership General

Are there any community leaders or organizations in place working to address the climate impacts happening here?

Probe: Are there community members who are working to address these challenges on behalf of the community? Who are they?

Probe: How has community leadership (i.e. activists/mayor/civic leaders) influenced or shaped community response to climate change impacts? Why are/were these leaders helpful in addressing climate change impacts. What did these leaders do that was helpful/useful?

Probe: Were there things you wish the community leaders had done that they did not do?

Probe: Have religious leaders addressed climate change and its impacts? Was this useful? Why?

(B). Are you a community leader working to address climate change impacts?

Probe: Why are you working to help your community address climate change impacts? Were people in the community vocal about this problem?

Probe: What have you done to work to address climate change impacts/help the community address climate change?

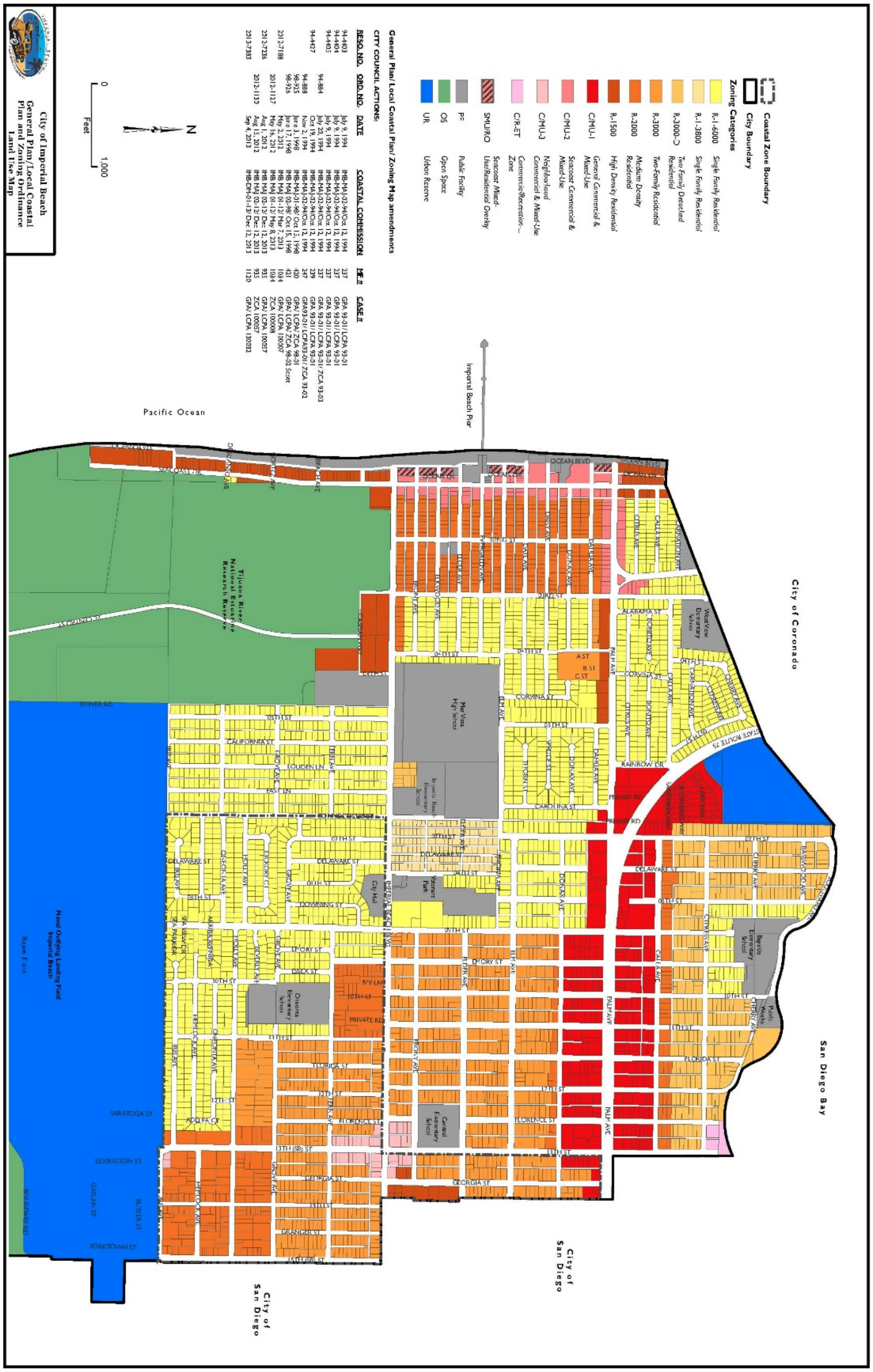
Probe: Do/did you experience people who are skeptical about climate change? How do you address that?

Probe: How might the community work together to address the issue of climate change in Imperial Beach?

I want to thank you for your kindness in sharing your thoughts and experiences about climate change. I will be transcribing this interview to paper and would like to share it with you when I am done so we can be sure I have accurately captured your thoughts, opinions, and feelings. I would be happy to answer any additional questions you may have at this time about this research and this process. Thank you again for your participation.

**Additional questions that may arise from the conversation are expected.

APPENDIX B: MAP OF COASTAL ZONE IN IMPERIAL BEACH



APPENDIX C: MAP OF PROJECTED SEA LEVEL RISE IN IMPERIAL BEACH