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Witnessing Climate Change in the United States Virgin Islands: Emotional Responses and Calls for Action

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WITNESSING CLIMATE CHANGE IN THE UNITED STATES VIRGIN ISLANDS: EMOTIONAL RESPONSES AND CALLS FOR ACTION

by

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ABSTRACT

Witnessing Climate Change in the United States Virgin Islands:
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Climate change is one of the greatest threats facing humanity in the 21st century. This study investigated people's observations of climate change in the United States Virgin Islands (USVI). A qualitative study was used with a Grounded Theory approach to better understand how people witnessed climate change events, what people's emotional responses were, and what calls for action they had to respond to climate change in the USVI. The study had two parallel arms: five focus groups (n=17) with residents of the USVI and key informant interviews with community leaders (n=10). Participants witnessed a wide array of climate change events including hurricanes, drought, and coastal erosion. Many participants experienced negative emotional responses to the environmental degradation caused by climate change in the USVI. These emotional responses were similar to what other studies have termed ecological grief and eco anxiety. While all participants experienced climate change in some way, age and duration of exposure to climate change events, gender, occupation, socioeconomic status, and recreational use of the environment seemed related to differences in how people experienced climate change. This study makes important contributions to the field as this area is understudied and undertheorized. Most importantly perhaps is to add the experiences of people in the USVI to the existing literature.

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I have to recognize the small moments of grace that got me to the finish line, like the coffee shop that didn't mind that I only ordered a single tea every afternoon or the librarian who printed my dissertation for me. It's small miracles every day!

Writing a dissertation during a pandemic is certainly a challenge. To write it during a time of political and social unrest is yet another. And then to layer on the climate crisis can seem like too much. But we get up every morning if we can. These are not easy times, but we need to bear witness, analyze, and respond.

For all those who have stories that need to be shared, we are listening. Tell them in your own way and your own time.

DEDICATION

This dissertation is dedicated to the memory of Shauna Bass who passed away before the study was completed but helped me tremendously as a friend and colleague. Shauna cared deeply about her home in the Virgin Islands and its people. I hope her memory continues to inspire us all.

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CHAPTER 1: INTRODUCTION

Rationale and Significance

Climate change is one of the greatest crises facing humanity in the 21st century (Ebi et al., 2018; Whitmee et al., 2015). The Earth's surface temperature has risen nearly one degree Celsius since the late 19th century, with the most dramatic increases in temperature taking place within the past 35 years (National Aeronautics and Space Administration, 2017). Projections indicate that the Earth's surface temperature will continue to increase by 4.5 °C by the end of this century if carbon emissions are not significantly reduced (Hanna et al., 2011). Researchers are beginning to understand how climate change affects people (Ebi et al., 2018; Whitmee et al., 2015). As climate change is experienced in place-specific ways, it is important to study the impact on people who live in different geographic locations. This research adds to the current literature to better understand people's experiences of climate change, specifically in the island and Caribbean contexts. This study explored people's experiences of climate change in the USVI and how it has affected them.

While all communities are likely affected by climate change in some form (Ebi et al., 2018; Kalkstein & Smoyer, 1993; Whitmee et al., 2015), current research indicates that certain populations may experience the effects most acutely (American Psychological Association & ecoAmerica, 2017; Campbell-Lendrum et al., 2009; Frumkin et al., 2008; Manning & Clayton, 2018; Patz et al., 2014; St Louis & Hess, 2008) including Indigenous communities (Berry, Butler, et al., 2010; Cunsolo Willox et al., 2013; Ford et al., 2010; Furgal & Seguin, 2006; McNamara & Westoby, 2011), women (McNamara & Westoby, 2011), agricultural workers (Albrecht et al., 2007; Askland & Bunn, 2018; Rhiney et al., 2016), and individuals living in

poverty (Fritze et al., 2008). Geographic location also shapes communities' vulnerability to climate change, for example, areas that are susceptible to drought (Albrecht et al., 2007; Askland & Bunn, 2018) or melting sea ice (Cunsolo Willox et al., 2013). Researchers have begun to assess the vulnerability of communities residing in island settings, including in the Caribbean (Macpherson & Akpinar-Elci, 2015; McNamara & Westoby, 2011; Rhiney et al., 2016; Springer, 2020; Springer & Elliott, 2019; Thomas & Benjamin, 2018).

United States Virgin Islands

The United States Virgin Islands (USVI) is unique in many regards, including its relationship to climate change. The territory was a Danish colony that was sold to the United States in 1917, and it has a history of colonialism and slavery that continue to inform the daily experiences of the people that live there (Lee et al., 2013). The main islands of St. Thomas, St. John, and St. Croix all have diverse populations, with the majority of people being of Afro-Caribbean descent, although many different races and ethnicities call the islands home (Roopnarine, 2010, 2014; Tonks, 2020). While some can trace back their families for several generations, others came to the territory more recently. This included migration from nearby West Indian islands (de Albuquerque & McElroy, 1982; McElroy & de Albuquerque, 1988). Many people, especially on St. Croix, have Puerto Rican heritage (Roopnarine, 2021). More recently, people have migrated to the USVI from Haiti and the Dominican Republic (D'Arpa, 2015). Others have relocated to the territory from the mainland and stayed. There is also a population of people that vacation yearly in the USVI, and some of these individuals are very wealthy (Uysal et al., 1994). Some of these tourists come to enjoy the natural environment like the SCUBA diving and snorkeling (Hillmer-Pegram, 2014), while others visit through cruise

lines (Culbertson et al., 2020). This means that the number of people on an island can dramatically increase during prime vacation seasons and when cruise ships are in port. Tourism is the main economic engine for the USVI (Hillmer-Pegram, 2014).

The population in the USVI is decreasing dramatically due to outward migration. In 2020, there were an estimated 87, 146 people living in the territory (U.S. Census Bureau, n.d.), which was an 18% reduction from 2010. Poverty is a major concern with 18.6% of families living below the poverty line. Children under the age of 18 represented 19.6% of the population and nearly a third lived in poverty. People over the age of 65 represented 21.3% of the total population. The territory is also majority Black: 71.4% of the population was Black, 13.3% of the population was white, and 18.4% of people were Latinx.

The USVI has a tropical climate (Brandeis et al., 2009), and it is common to see coconut trees, palm trees, mango trees, and many types of flowering plants. Most people live in direct contact with the natural world and weather on a daily basis, and many people also live in close proximity to the sea. People use beaches recreationally, and it is common to see barbeques on the weekend to celebrate birthdays or graduations. The main commercial and governmental centers in St. Croix and St. Thomas are directly on the water. Many USVI residents have lived through several major hurricanes, most recently Hurricanes Irma and Maria, which the islands are still recovering from.

Climate Change in the United States Virgin Islands

Island jurisdictions offer a unique opportunity to study the effect of climate change on people because islands are susceptible to multiple types of climate change events. These climate events tend to be highly visible to the people that live there and have the potential to affect most

island residents, and inhabitants have experienced the impacts for many years if not decades (McNamara & Westoby, 2011; Simmons, 2021; Walshe & Stancioff, 2018).

The temperature of the ocean water surrounding the USVI has risen by nearly two degrees Celsius since the beginning of the 20th century, and the sea level has risen approximately one inch every decade (Environmental Protection Agency, 2016). Warming waters have already damaged the coral reefs, and tropical storms have become more severe over the past two decades, while the total rainfall in the Caribbean has decreased (Environmental Protection Agency, 2016). Chronic climate change effects in the USVI include ocean warming, drought, and rising sea levels (Environmental Protection Agency, 2016). The USVI is extremely vulnerable to the impacts of climate change for a variety of reasons, including its political territorial status (Díaz et al., 2018), and substantial inequities in healthcare (Callwood et al., 2012; Veenema, 2019; Vladutiu et al., 2019).

Currently, no known studies explore the climate change observations of people in the USVI, its emotional impact on them, or what actions people wanted to take see to mitigate the negative impacts of climate change in the territory. The USVI is one of the most vulnerable locations in the United States to climate change and remains understudied. Additionally, there are limited studies exploring the experiences of people that live on islands that are subjected to multiple climate threats simultaneously and sequentially. There are also very limited studies that focus on Black or Afro-Caribbean populations.

Study Aims

This research explored people's experiences of climate change in the USVI. Specifically, the study aimed to answer the following research questions:

1. What changes to the natural environment as a result of climate change have people in the USVI witnessed?
2. How have these changes impacted people in the USVI's emotional well-being?
3. What would people like to see happen in the USVI to respond to the climate crisis?

In order to answer these questions, I conducted a qualitative research study to better understand people's experiences. I used two methods of data collection: virtual interviews with key informants and, concurrently, virtual focus groups with participants.

Social Work and Climate Change

Many disciplines, including human geography, public health, and philosophy, have explored the impact of climate change on people (Ellis, 2016). Climate change research is inherently interdisciplinary because of the complex nature of the problem and the need for a holistic response (Ellis, 2016). Social work is well-positioned to contribute to this scholarship because it cuts across a wide range of service settings and populations. Advocating for the health and well-being of marginalized populations and framing social issues through a social justice lens is central to the profession's Code of Ethics (National Association of Social Workers, 2017; Uehara et al., 2013). Additionally, social work has long championed a person-in-environment perspective, even though it has largely understood the environment to be the social sphere (Hayward & Joseph, 2018). Kemp (2011) suggested that social work's history as a multi-disciplinary profession with deep connections to communities makes it well suited to respond to the climate crisis. However, social work has been slow to embrace its role in climate change research and the climate justice movement (Kemp, 2011).

In 2014, the American Academy of Social Work and Social Welfare (the Academy)

established twelve Grand Challenges representing major social issues that needed to be addressed in the 21st century. One of the Academy's Grand Challenges was to develop social responses to changes in the environment (Uehara et al., 2013) and called for social workers to conduct research that examined and addressed inequities and resiliency in this area. Building a social work knowledge base around people's experiences of climate change will help develop a foundation for designing person- and community-centric interventions and policies that address the impact of climate change on communities, especially vulnerable populations.

The following chapters examine the empirical and theoretical literature regarding the effects of climate change on communities, a description of the methodology used for the study, key findings developed from themes, and a discussion chapter contextualizing the contributions of this study.

CHAPTER II: LITERATURE REVIEW

The previous chapter described the rationale for this study. This chapter reviews the empirical literature related to people's experiences of climate change and its impact on their well-being. I discuss gaps in the literature and relevance to the proposed study. Theoretical concepts that inform the study as potentially sensitizing concepts are also reviewed.

Awareness of Climate Change

Across the scientific community, there is widespread consensus that climate change negatively affects people (Ebi et al., 2018; Lenzholzer et al., 2020; Whitmee et al., 2015). Yet, there remains variability in the general public's awareness and understanding of climate change. To better understand people's perceptions of climate change, Knight (2016) analyzed national-level data from 128 countries from the 2007–2008 and 2010 Gallup World Polls, which provided the largest available international datasets on climate change public opinion. At the national level, Knight found that there was greater awareness of climate change in countries that were wealthier and more highly educated. This awareness did not seem to be influenced by political orientation or vulnerability to climate change.

Lenzholzer and colleagues (2020) conducted interviews in ten countries to better understand people's awareness of climate change across four groups living in urban areas: the general public, urban planners, local politicians, and urban climate change specialists. The countries studied were Belgium, Bulgaria, China, Germany, Indonesia, Kenya, Netherlands, New Zealand, South Korea, and the United States. The countries selected represented different climate zones and different political landscapes. Lenzholzer and colleagues found that a decreased awareness of climate change was associated with the general public and politicians, while

increased awareness of climate change was associated with urban planners and urban climate change specialists (Lenzholzer et al., 2020). This suggested that specialized training, educational attainment, or professional discipline may inform people's awareness of climate change. They did not provide an analysis by demographic factors, such as gender or socioeconomic status.

Vulnerable Populations and Climate Change

Cunsolo Willox and colleagues (2013) used a mixed-methods approach to better understand the effects of climate change on an Inuit community in Northern Canada. The research team interviewed 72 individuals and found that study participants noticed shifts in weather patterns, decreased amounts of snow and ice, increased intensity and frequency of weather patterns, and changes in precipitation. This research suggested that the Inuit were very aware of climate change effects at a local level. McNamara and Westoby (2011) noted a similar level of awareness amongst Indigenous people in the Torres Straits, which are islands located between Australia and New Guinea. They interviewed 28 people who lived in close proximity to the shoreline (McNamara et al., 2017), and the participants noted coastal erosion and seawater flooding as issues.

The Caribbean

Studies focused on people living in the Caribbean have also documented people's awareness of climate change. Macpherson and Alkpinar-Elci (2015) convened focus groups with healthcare providers in Trinidad and Tobago and nearby Grenada to better understand their awareness of climate change. They found that healthcare providers were aware of changes to the environment that could be associated with climate change, including higher temperatures, storms, and drought (Macpherson & Akpinar-Elci, 2015). They did not publish the total number

of participants or the total number of focus groups, which would be informative. In a study of healthcare providers in Barbados, Springer and Elliot (2019) found that the majority of participants had a global understanding of climate change and noted local changes including increased temperatures, increased hurricane activity, and changes to rainfall patterns. Rhiney and colleagues (2016) found that a majority of cocoa farmers in Jamaica and Trinidad noticed changes to weather events over time, including rainfall patterns and changes in the rainy season.

In Providencia, a Caribbean island off of Colombia, Altschuler and Brownlee (2016) interviewed 24 people about their perceptions of climate change. Most of the individuals interviewed demonstrated an awareness of the impacts of climate change at a local level. Study participants noted erosion, coral bleaching, changes in weather patterns, and impacts on animals and vegetation. The researchers linked this awareness closely to individuals' attachment to their environment, family characteristics, and occupation. However, they did not explain these themes in any great depth. Stancioff and colleagues (2018) completed face-to-face surveys with 174 households in St. Kitts. Coastal erosion and flooding were reported as major concerns among participants. Female participants appeared to be more concerned than male participants about climate change.

Thomas and Benjamin (2018) found more variation in people's awareness of climate change in The Bahamas. Using an online survey of 541 individuals, they found that 45% of respondents believed that climate change had a global impact, while only 25% of respondents believed that it affected their own families. Comparing these studies suggests that there may be variability across and within Caribbean islands.

Emotional Responses to Climate Change

Researchers have documented that rapid changes to the physical environment result in negative health and mental health consequences for Indigenous communities (Berry, Butler, et al., 2010; Cunsolo Willox et al., 2012; Ford et al., 2010; Fritze et al., 2008; Furgal & Seguin, 2006; Rigby et al., 2011). Durkalec and colleagues (2015) convened two focus groups and interviewed 22 members of the Inuit community. These community members expressed positive emotional connections to sea ice travel for both recreational and cultural activities. When the sea ice was depleted due to climate change, people expressed feelings of stress.

In addition to Indigenous communities, agricultural sector workers seem to be heavily affected by climate change. Pearce and colleagues (2015) used a mixed-methods approach to better understand the impact of reduced rainfall and higher temperatures on rural communities in Australia. They collected data via a postal survey of 96 non-Aboriginal households, and they also conducted three focus groups with Aboriginal individuals. They found that loss of employment affected farmers' sense of well-being. For Aboriginal individuals, the reduction of the pastoralist sector due to drought was especially hard on their mental well-being, with many people having to relocate and find new means of earning a living. Sartore and colleagues (2008) studied similar communities in rural Australia. Thirty people participated in focus groups representing different groups including farmers, businesspeople, and health and other support workers. Key themes that emerged from their study included personal financial loss, impact on community resources, and restricted employment options. Through their ethnographic fieldwork, including interviews with 20 participants, Askland and Bunn (2018) also found a deep connection between place and a sense of well-being for people living in rural Australia.

While studies on the impact of climate change on people's livelihoods have largely focused on communities in Australia, Smith and Rhiney (2015) conducted research in traditional farming villages in St. Vincent, an island in the Caribbean. Data were collected after a severe drought that followed Hurricane Tomas in 2010 via a survey of 311 households, 70 unstructured interviews, and two focus groups. Smith and Rhiney found that farmers in this region were particularly vulnerable to the negative impacts of climate change on their livelihoods.

Feelings of Loss

In a study about the Great Barrier Reef in Australia (Marshall et al., 2019), researchers examined ways in which the destruction of the coral reef affected people. The results of this survey indicated that members of certain sub-populations experienced "reef grief" while others did not. Reef grief was defined by the researchers as a type of grief associated with the destruction of the coral reef. Of note, people who rated the reef with a high aesthetic value, including tourists, reported lower levels of reef grief. People who had a stronger attachment to the reef reported a greater sense of loss related to its damage.

Cunsolo Willox and colleagues (2013) investigated the phenomenon of melting ice and its impact on Inuit community members in Northern Canada. Participants reported a deep connection to the land and a sense of loss associated with their inability to access land due to melting ice. People reported that they felt like their true selves when they could access the land. Loss of access to the land was associated with losing one's sense of self (Cunsolo Willox et al., 2013).

An emerging body of work has focused on the experiences of people living on islands and their experiences of loss related to climate change. In their study, McNamara and Westoby

(2011) conducted semi-structured interviews with five older women, or "aunties," on Erub Island in the Torres Strait and substantiated that these women's experiences of climate change included feelings of distress, worry, and fear. Although the age of the women was not specified, they were identified as community elders, which indicated both a social and an age status. In a study based in Utila, an island off of Honduras, researchers (Kent & Brondo, 2020) examined people's experiences living on an island impacted by the depletion of flora and fauna over time. Participants reported feeling a sense of nostalgia for times in which flora and fauna were more plentiful.

Concern about the Future

Research has suggested that climate change also inspires a feeling of concern about the future. In a study with Inuit community members, Cunsolo Willox and colleagues (2013) found that participants experienced uncertainty and frustration about how climate change would affect their community in the future and questioned how future changes to the environment may alter Inuit culture. MacDonald and colleagues (2015) found that Inuit youth felt worried about the continued impact of climate change on their environment.

Research has also documented feelings of concern about the future in the Caribbean. Thomas and Benjamin (2018) found that 80% of survey respondents in The Bahamas foresaw negative future impacts of climate change. The majority of respondents endorsed beliefs that flooding would increase and that hurricanes and storms would become more frequent and intense. Similarly, Kent and Brondo (2020) found that the people of Utila expressed fear for the future and anticipated negative impacts on flora and fauna. Kent and Brondo termed this fear "anticipatory grief."

Gaps in the Literature

Existing literature about people's experiences of climate change is limited to a few specific locations and populations (Galway et al., 2019). Research has also been limited by a lack of consistency in methods and the operationalization of key variables (Coffey et al., 2021; Galway et al., 2019). From a quantitative perspective, existing studies were also limited by their small, non-representative sample sizes that preclude the generalization of findings. Various researchers have called for additional research that is site-specific and focused on additional vulnerable communities (Cunsolo Willox et al., 2012; Fritze et al., 2008; Galway et al., 2019).

The Caribbean was under-represented in the related literature, despite the fact that people in the Caribbean are extremely vulnerable to climate change threats and may have similar experiences to other populations that have been studied (Albrecht et al., 2007; Cunsolo Willox et al., 2013; McNamara & Westoby, 2011). People living on Caribbean islands, including the USVI, are predominantly of African descent. The literature does not fully explore the ways in which the sociohistorical and cultural background of this population may shape their experiences of climate change, and if climate change's effects on their well-being are similar to or different from other populations. The effects of racism and colonialism on people's experiences have been largely unexplored in the climate change literature from the Caribbean, though they have been referenced in studies of Indigenous communities (Galway et al., 2019).

While studies suggest overall trends of concordance across groups, further investigation is needed to study experiences of climate change across subgroups of people from the Caribbean, such as young adults, elders, women, and people whose occupations are highly dependent upon the environment such as farmers and fishers. This study attempted to address some of these gaps

in the literature, including the experiences of people living in the Caribbean, on islands, and in a place comprised of a majority of individuals with Afro-Caribbean heritage.

Theoretical Concepts for Emotional Responses to Climate Change

The effects of climate change on people are under-theorized. Scholars have begun to develop theories to help elucidate people's experiences of climate change framed through a lens of loss (Albrecht et al., 2007; Cunsolo Willox & Ellis, 2018; Tschakert et al., 2019). Three emerging concepts have been used in the literature to better understand people's experiences of climate change and loss including solastalgia, ecological grief, and eco anxiety. These concepts may be useful constructs for understanding people's experiences of climate change. Several scholars have embraced solastalgia as a theoretical construct as it has been in use longer than ecological grief or eco anxiety (Albrecht et al., 2007; Askland & Bunn, 2018; Galway et al., 2019).

Solastalgia

Glenn Albrecht, the Australian environmental philosopher, developed the concept of solastalgia (2007). Central to this theoretical concept were the connections between place, identity, and loss. Solastalgia was a neologism bridging "solace" and "nostalgia," representing the sense of loss one feels in the face of environmental change. Albrecht linked distress regarding one's environment, or "ecosystem distress," with individual or emotional distress. Ecosystem distress results from activities of environmental degradation including both human-driven and natural disasters, including changes that are acute and chronic in nature (Albrecht et al., 2007).

Albrecht's solastalgia was among the first to explain the sense of loss people experience

related to environmental degradation. Individuals facing environmental degradation may experience stress related to feelings of powerlessness coupled with perceptions of environmental injustice being committed against them and their land (Albrecht et al., 2007). The concept of solastalgia proposed that major changes in the environment result in the breakdown of an individual's identity and connection to the environment they inhabit. Albrecht's work (2007) suggested that any place that has experienced radical changes could be a potential setting for the experience of solastalgia.

Higginbotham and colleagues (Albrecht was part of the team) (2006) sought to operationalize the concept of solastalgia using the Environmental Distress Scale. The scale drew upon previous qualitative fieldwork with communities experiencing the negative effects of mining in Australia. The Environmental Distress Scale combined dimensions of hazard perception, threat appraisal, the felt impact of changes, solastalgia, and environmental action. The instrument used a Likert scale to assess people's feelings about the place they live and the frequency they experience environmental issues. The scale asked people to rank how they have been impacted by environmental degradation with statements like, "I am unable to enjoy life as much as I'd like because of local environmental problems," "My sense of belonging to this place has been undermined by unwelcome change," and "I am sad that familiar animals, plants, and fish are disappearing from this place." There was also a section of the scale that asked people to respond "yes" or "no" if they have taken certain actions in response. Examples of these actions included writing a letter to the editor of a newspaper, attending a community meeting, or contacting government officials about an environmental issue. The scale was adapted by other researchers to other contexts including volcanic eruptions in Indonesia and wildfires in Arizona

(Eisenman et al., 2015; Warsini et al., 2014). Askland and Bunn (2018) sought to further clarify the concept of solastalgia. Similarly to Albrecht, their research focused on a mining community in Australia. They found that people were most concerned about the loss of community and the ambiguity placed on their future. The researchers critiqued the way that solastalgia had been applied, claiming the concept pathologized people's experiences of changing environments.

In their review of the solastalgia literature, Galway and colleagues (2019) questioned if perhaps solastalgia as a concept was bound within Western conceptualizations of grief and if there were other culturally bound perspectives that could also be useful, especially for non-Western communities. Galway and colleagues recounted how an Indigenous scholar suggested that solastalgia was a colonized term and that Indigenous communities had words in their languages that more accurately reflected Indigenous experiences related to grief and loss of the natural world.

The broadest critique of solastalgia is that the term has not been applied consistently by researchers (Galway et al., 2019). As a relatively new concept, the theory is still being tested and validated through empirical studies (Eisenman et al., 2015; Galway et al., 2019; Higginbotham et al., 2006; Warsini et al., 2014). While solastalgia has played a large role in shaping the literature related to people's emotional responses to climate change, scholars have begun to develop additional concepts.

Ecological Grief

Ecological grief is an even newer, though similar, concept to solastalgia (Comtesse et al., 2021), and it shares a similar phenomenology and conceptual foundation. Like solastalgia, ecological grief is not yet fully understood (Cunsolo et al., 2020). Some researchers consider

solastalgia to be a sub-group under ecological grief, as traditionally solastalgia focused on the landscape while ecological grief encompasses all ways that nature is impacted including the flora and fauna (Comtesse et al., 2021). Comtesse and colleagues (2021) stated that there is a lack of conceptual clarity and no common research agenda to better understand ecological grief.

Cunsolo and Ellis (2018) defined ecological grief as "the grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems, and meaningful landscapes due to acute or chronic environmental change" (p. 275). They identified three components of ecological grief: a) loss of one's physical environment, b) loss of identity, and c) anticipated future losses. Ecological grief draws on findings from Cunsolo and Ellis' studies (2018) with Inuit community members and Australian farmers. Researchers have argued that ecological grief is a natural response to changes in the environment (Comtesse et al., 2021). There are currently not enough empirical studies on ecological grief to thoroughly compare studies in different locations or to level cogent critiques of its application.

Eco Anxiety

Eco anxiety is also an emerging concept to help understand people's responses to climate change (American Psychological Association & ecoAmerica, 2017). Eco anxiety can be a normal response to the degradation of the environment, and it is not always associated with a medical condition (Clayton & Karazsia, 2020). Some suggest that it may be more apt to call it an emotional response (Coffey et al., 2021). While solastalgia and ecological grief focus on the loss of a past that will not occur again, eco anxiety tends to focus on concern about the future (Albrecht, 2011). As an emerging concept, there is still variation in how the term is deployed (Coffey et al., 2021).

Research on eco anxiety has been particularly focused on young people. Younger people may be more susceptible to climate anxiety, which may affect their ability to function in daily life (Clayton & Karazsia, 2020). In addition to young people, Coffey and colleagues' systematic scoping review of the literature (2021) found that Indigenous communities and those who feel a connection to the natural world are likely to be most affected by eco anxiety.

Summary

This chapter reviewed the current empirical literature of people's experiences of climate change and how it affects them. Three potential sensitizing concepts were also reviewed: solastalgia, ecological grief, and eco anxiety. The next chapter reviews the methodology of the study including study design, sampling and recruitment strategies, and methods for analysis.

CHAPTER III: METHODOLOGY

In the previous chapter, I reviewed literature that examined people's experiences of climate change, and I identified a gap related to better understanding people's experiences in the USVI as their location is highly affected by climate change. I designed this study to better understand people in the USVI's experiences. Specifically, the study sought to answer the following research questions:

1. What changes to the natural environment as a result of climate change have people in the USVI witnessed?
2. How have these changes impacted people in the USVI's emotional well-being?
3. What would people like to see happen in the USVI to respond to the climate crisis?

This chapter reviews the methods I used to answer those research questions.

Study Design

I conducted a qualitative study to better understand people's experiences of climate change in the USVI. A qualitative approach is well-suited for seeking a greater understanding of subjective experiences and emerging phenomena (Creswell, 2007). Qualitative inquiry can be used to develop theory to explain social processes and phenomena that can help inform future research (Creswell, 2007). Creswell and colleagues (2007) suggest that Grounded Theory approaches are appropriate for questions related to processes over time. As climate change is best understood over time, this approach was well suited to this study. While a narrative approach would have allowed for an in-depth look at one person's experiences, a Grounded Theory approach looks at a process involving many people, and the goal of this study was to examine commonality across people. Grounded Theory is also used when theory is not available

or the existing theories seem inadequate. As this study considered an emerging topic that is undertheorized, a Grounded Theory approach also seemed appropriate. I also appreciated Charmaz's considerations of a "constructivist" Grounded theory that allowed the space for conclusions to be understood as suggestive rather than proscriptive and incomplete rather than all-encompassing (Charmaz, 2000).

I originally designed this study with the intent to collect data in person. However, because of the COVID-19 pandemic, I redesigned the study to collect data virtually. I conducted the study in two parallel arms. As part of Arm 1, I moderated focus groups to better understand people's experiences of climate change in the USVI. In Arm 2, I interviewed community leaders to discuss themes that emerged from the focus groups as a method of triangulation and to strengthen the rigor of the study. I interviewed the informants in between the timing of the focus groups, so the two arms of the study ran concurrently.

Sampling and Recruitment

Focus Groups

I used purposeful sampling to ensure that a diverse and appropriate range of perspectives was included in the study. The aim of a purposeful, non-random sample is to yield rich data to better understand the area being studied (Hennink et al., 2019). The intent is not to provide generalizable knowledge but to uncover data steeped in people's experiences (Creswell, 2007). Purposeful sampling drew upon participants from groups that the literature indicated were most impacted by climate change, which included farmers, young people, older people, and women (Albrecht et al., 2007; Cunsolo Willox et al., 2013; McNamara & Westoby, 2011). I recruited participants for the study by leveraging existing relationships with trusted community-based

organizations. I reached out to these organizations and asked them to share the recruitment information via their listservs. Participants were given a $25.00 incentive for participating in the focus group. I also reached out specifically to agricultural and fishing groups; however, these efforts did not result in any participants.

I conducted five focus groups before theoretical saturation was achieved (Coonan, et al, 2012; Guest, et al., 2016; Hennick, et al., 2019). Saturation sampling occurs when no new themes emerge and further data collection is not needed. The total number of participants in this arm of the study was 17 individuals. To meet the inclusion criteria for the study, participants had to live in the USVI, be over the age of 18, and feel comfortable using English to participate in a focus group.

Demographic questionnaires were distributed to all 17 participants; however, most declined to complete the questionnaire as the forms were not required to participate in the study; therefore, basic demographic information was not collected. The following information is based on the questionnaires I received, as well as based on observation or from details provided through the focus groups and individual self-disclosure of demographic information. Participants' ages ranged from early twenties to seventies, and most appeared to be over the age of 50. Twelve presented as female and five as male. Some participants revealed during the focus groups that they had professional knowledge about climate change or environmental topics, although most participants did not.

Key Informants

Purposeful sampling was also used for key informants. I used the network of

professionals that I had developed during my work in the USVI to reach out to community leaders who could share insights into the topic of study. I also reached out to environmental groups that I did not have a previous relationship with. Additionally, I reached out to government agencies that were related to climate change. I also used snowball sampling; I asked the informants to share suggestions for other people to interview (Creswell, 2007). Saturation was achieved after 10 interviews were conducted.

I recruited informants by sending them a recruitment email (Appendix C). If they replied positively, I went forward with the interview. No incentives were provided to informants as they were asked to participate in their official capacity. Informants had to be at least 18 years of age and live in the USVI. They also had to hold a position as a community leader. "Community leader" for the purpose of this study meant that the individual held a leadership position within the government, university, nonprofit, or small business. The informants represented the healthcare, agricultural, educational, and environmental sectors.

Again, formal questionnaires were not required to participate in the study, but the informants self-disclosed some demographic information or it was discerned through observation by me. The majority of informants were Black/Afro-Caribbean (n = 7) and female (n= 8). Half of the informants lived in St. Croix (n=5) and half lived in St. Thomas (n=5).

Data Collection

Focus Groups

Focus groups are a common practice in qualitative studies. They create spaces to foster and examine interactions among participants. Group members are able to co-create meaning as well as respond to one another. Focus groups also allow the researcher to see differences in

opinions and experiences simultaneously across the group. This method encourages the group to drive the discussion rather than the researcher. This collective sense-making allows the researcher to see how views are created in conversation with others (Wilkinson, 1999). Focus groups thus facilitate shared knowledge that is not possible in one-on-one interviews (van Hoof et al., 2019). Additionally, focus groups can decenter the researcher's primacy, allowing for intra-group discussion, and thereby avoiding decontextualizing participants' experiences (Morgan, 1996; Suzuki et al., 2007; van Hoof et al., 2019; Wilkinson, 1999). Given my outsider status as a cisgender white male from the mainland who works for the government, this advantage of focus groups felt particularly useful in eliciting the voices of USVI residents.

I moderated the focus group discussions remotely using Zoom. As part of the screening process, participants were invited to select a convenient location, such as their homes, to participate and were encouraged to select a location that could maximize privacy. In order to gather in-depth, detailed data, all focus groups were conducted in a conversational format, allowing for new and unexpected themes and ideas to emerge beyond the initial questions (Kvale, 1994). Each focus group lasted approximately 90 minutes and consisted of open-ended questions created to discover individual and collective observations of climate change and perceived impacts. The focus group interview guide (Appendix D) covered topics such as people's experiences of living in the USVI, awareness of climate change and its impact, and disruption to social and cultural practices and livelihoods. During the initial focus groups, participants raised the importance of discussing solutions and what people would like to see happen in the USVI to mitigate climate change. This resulted in my adding the third research question to the study, as is a common practice in qualitative studies (Agee, 2009). All focus

groups were audio and visually recorded, and I transcribed the recordings verbatim for analysis.

Key Informants

I conducted individual interviews remotely via Zoom with community leaders. Interviews lasted approximately one hour. The interview guide for informants (Appendix E) included open-ended questions and prompts to dive deeper into a discussion of the themes that emerged from the focus groups. All interviews were audio and visually recorded, and I transcribed them verbatim for analysis.

Special Considerations for Anonymity

Pseudonyms are used for both informants and participants to maintain their anonymity in this document. While demographics were not formally collected, I try to indicate relevant characteristics associated with the quotes throughout the findings chapters. In a place like the USVI, anonymity brings up particular considerations. As it is such a small population, many people know one another and could perhaps know who said a quote or even just believe they know who said a quote. In particular, I believe that many of the informants know one another. In order to protect the study participants, I chose to use minimal attributes in the study. While nothing was seemingly controversial in what was said, it was still important to me to try my best to protect their anonymity. While anonymity is not possible in a focus group, confidentiality is, and this was stressed during data collection in the focus groups.

Data Analysis

I used the qualitative software NVivo to analyze the focus group and key informant interview data. In alignment with Grounded Theory methods, I analyzed the focus group data using an iterative, systematic qualitative analysis. Content analysis and process analysis were

undertaken through a constant comparative method and systematic, inductive coding to allow for emergent themes within place-specific observations (Creswell, 2007) of climatic and environmental change and impacts on well-being. This approach required immersion in the transcripts through a multi-step iterative process: First, I read and re-read transcripts while listening to the recordings to note nuances in tone and voice (Cunsolo Willox et al., 2013). Open, line-by-line coding took place during a close reading of the data. After that, I focused on axial coding to discern overarching themes. The resulting themes were verified on several occasions with doctoral peers and with my committee chair to ensure the accuracy and authenticity of the categories. Codes were then expanded and collapsed to reflect newly discovered themes and ideas that emerged from these discussions. I used the final list of codes to re-code the transcripts, and I used the core codes to organize my analysis of the data.

Strategies for Rigor and Trustworthiness

There are various strategies for ensuring rigor for a qualitative study. Through NVivo, I established an audit trail for my coding and memoed during the analysis phase (Padgett, 2016). I also used peer debriefing and support, sharing de-identified transcripts with two other researchers to review my coding in order to address my own potential bias in the coding and analysis (Padgett, 2016). Lastly, I used triangulation of data to counter potential participant bias (Padgett, 2016) by collecting data from focus group participants as well as from key informant interviews with community leaders. These strategies helped me feel confident that I was not relying solely upon my own interpretation of what people said.

Protection of Research Participants

Institutional Review Board (IRB) approval (#2021-0114) was obtained through the

Hunter College/CUNY Human Research Protection Program (Appendix A). The study was designated as having minimal risk. Participation in the study was voluntary, and participants were informed of their right to withdraw from the study at any time. All recruitment and consent materials were digital (Appendices B and C). Participants were provided with an electronic information sheet about the study. Those who met the inclusion criteria and agreed to participate were asked to verbally consent to participate prior to the start of the focus group or interview.

I used the online platform Zoom, which was secured by having a waiting room, for recording videos of the focus groups and interviews. I allowed each individual permission to enter the platform. Since consent was oral, no forms were stored with identifying information. All data files were electronically stored on a single password-protected computer to which only I have access. Names and identifying information were excluded from the transcriptions. All resulting reports and publications were de-identified and pseudonyms used to protect the confidentiality of the participants.

Positionality and Role of the Researcher

Positionality and role of the researcher are critical in social and behavioral studies as they may introduce different researcher and research biases that need to be identified and understood. I have worked with USVI organizations, predominantly from the healthcare sector, for over a decade as part of my job. It has become important for me to be a champion for the territories through my work, and I chose to focus my dissertation on the USVI as an act of solidarity. The territories in general are often overlooked in research.

My professional and personal relationships in the USVI were deepened through my work as part of hurricane recovery efforts from 2017 until the present day. Hurricanes Irma and Maria

devasted the USVI. While I was not personally impacted by the storms and I cannot fully understand what it meant to live through them, it reminded me of experiences in New York related to Superstorm Sandy. As part of the healthcare recovery team, I was deployed to the USVI several times over a six-month period and developed a wider professional and personal network. I met daily with people throughout the USVI to better understand their needs after the hurricanes. I traveled across St. Croix, St. Thomas, and St. John and increased my understanding of the daily lives of Virgin Islanders. I anticipated that the professional relationships I developed over the years would help to mitigate any potential virtual implementation and feasibility concerns regarding this study.

As an outsider, I had the benefit of a level of objectivity to what I was observing and hearing. I attempted to be a safe space as someone who is not a part of the community and will not pass judgment. Since I did not grow up in the USVI, and I did not reside there during the study, I was cautious to understand people in their own words and to ask for clarification throughout this study. I consistently interrogated my position as an outsider, especially in light of the colonial history of the territory. I attempted to build trust and rapport with all participants and establish a relationship. Relationships are critical to the social fabric of the USVI, which I sought to respect throughout the study. Finding a human connection, even as simple as knowing local restaurants or music, seemed to be the most effective strategy for establishing a connection.

As an outsider, I also sought to discuss the research project with individuals living and working in the USVI as I designed the study, and I incorporated their feedback. Through initial conversations with partners in the USVI, I found strong support for this study. This included speaking with climate change researchers at the University of the Virgin Islands, government

officials, and people who worked at community-based organizations. One community-based organization in particular strongly supported the idea of focus groups over one-on-one interviews as a more culturally appropriate method for collecting data.

As a white male, I was keenly aware that my gender and race had the potential for a power imbalance during the collection of data. It was critical that I understand the history and culture of the USVI to be able to navigate this with sensitivity. Over the years that I have worked on issues related to the USVI, I have immersed myself in the history and culture of the territories. This includes reading books, listening to music, and reading the daily news, as well as speaking with numerous people. I also used cultural humility, as well as my past experiences establishing trust in the USVI. One strategy I used to question my assumptions and privileges was presenting findings to stakeholders during the various stages of analyses and listening to and incorporating their feedback.

Another thing to consider was that some people knew me in the USVI as a government employee. As the government is sometimes distrusted by the general public, I stressed to informants and participants that I was interviewing them as a researcher and not in my capacity as a government employee. There is potential that this shaped some discussions with informants, but I did not know most of the people that participated in the study and their connection to programs I work on in my government capacity was limited. In fact, at times, it seemed as if my work history in the USVI was seen as a positive because I understood things that a complete outsider would not have a reference for. I also believe that having worked in hurricane recovery efforts validated for people that I saw the devastation and knew how difficult it had been for so many. I think people understood that I was not a “parachute researcher” but committed to the

work over a longer duration. I also memoed extensively to interrogate such questions, which led me to believe that they did not dramatically shape people's responses. I also had discussions with people not involved in the study to review such concerns.

Summary

In this chapter, I reviewed the methodology used for the study. A Grounded Theory approach was used as the best mode for answering the research questions. I used both focus groups and key informant interviews to collect data, and I used NVivo to analyze the data and determine themes. In the next chapter, I review the results of this analysis.

CHAPTER IV: STUDY FINDINGS

This study explored how people in the USVI witnessed climate change, their emotional responses to those changes, and their calls for action. In this chapter, I review the first two elements and explore calls for action in Chapter V.

Witnessing Changes to the Environment

Participants shared ways in which they witnessed climate change's effect on the natural environment. I begin by reviewing the observations that they shared, which were almost always confirmed within and across focus groups and interviews. In the following section, I review how what they observed also revealed an emotional response. While the quotes on the page can static, they were often said in ways that were very emotive of feelings of loss and concern.

Drought

In response to a question about what climate change events he had noticed, a younger participant Jamie, shared, "It just doesn't feel like it rains enough anymore." Zola, another participant who grew up in the territory, reported that "It doesn't rain that much, and it just looks brown … Sometimes it's like that for weeks." Wendy, an informant who could trace her family back generations in the USVI, said that the "lushness has changed." Rebecca, whose work was connected to the natural environment, shared, "From a personally and professionally informed perspective, drought is the thing that's gonna most frequently and most acutely affect the most Virgin Islanders in the nearest timeframe."

Deborah, another participant, noted that even drought-resilient plants were being negatively impacted:

> And I've never ever ever, I never used to see coconuts; you know coconut is very resilient even when the weather is hard … Sometimes when we have less rain, we have a lot of heat, and those leaves dry up so quickly, and they fold. And I'm like, wait a minute, I never used to notice this.

Nigel, an informant who lived in St. Thomas, also described what he saw happening to the coconut trees, "You had coconut trees, who are very durable. Okay, they can take the heat. When you see coconut trees literally over the day laid out. Literally to lay down over a week or two, so that yeah stands out clearly."

Jackie, a participant residing in St. Thomas, also mentioned the mangroves, "I remember as a child, I was always fascinated with the mangroves, and when you drive, or you go to visit the eastern end of St. Thomas or even on St. John, the mangroves have dried." Lucinda, an informant who also lived in St. Thomas witnessed this as well, "You know a lot of the mangroves are drying up."

Megan an informant who had moved from the mainland and led a non-profit stated, "Farming is getting harder because of these droughts, and so the farm season is weird and unpredictable and shorter, and the farmers are struggling." Norma, a participant who was a farmer, said:

> You're dealing with the heat, with the lack of water … You don't have enough [water] to really share with the iguana, the songbirds, the deer, so you have those competitive forces coming along with the environmental forces, which is discouraging.

In addition to farming, people noted the impact of drought on their home gardens. A participant living in St. Croix, Zola, said that it was harder to keep her plants alive than in the

past:

> I have a banana tree in my backyard, and I noticed that I have to be watering it almost every day, you know, especially during the drought season, because if I don't it will start turning yellow, and I want my banana tree to grow because I want to eat bananas almost every day. I had another tree that I planted, and it dried out on me … and I was watering it too.

In the past, it was not uncommon for people to have small home gardens or even small farms, but many people relied mostly on the rain to take care of their plants. Now they had to water them. Roger in St Thomas shared:

> I've been planting all my life, and we've been pulling food out of our yard all my life, and now suddenly that amount has declined. When I say I'm not a farmer, I wasn't the person who would go out there and take buckets of water to these plants and crops every day. They were growing on their own. Now they need to be watered.

In addition to plants, many noted the impact of drought on local fauna. Helena, a participant who had moved from the mainland, agreed with her focus group members about the effect on local deer populations:

> But I know that it has gotten drier and drier, they [deer] come because before like you said they would be there, but it was rare to see them, but because they're looking for water. That's one of the things that they're looking for, sometimes very desperately. They'll come up near apartments in places where you would never see them before. If there's water outside, they will definitely drink it.

Rachel, who had moved to St. Croix and raised her family in the territory, also spoke

about drought's impact on household finances:

> We are a cistern-based water system, and when you don't get rainfall, your cistern doesn't get filled. And we buy a typical truckload of water for $260, and oftentimes for three or four months in a row, we're buying water every three weeks approximately, so that can impact the family's budget fairly quickly.

There appeared to be variation in people's observations of droughts. When her focus group discussed the topic, Aisha said

> Maybe I should be paying more attention to it because I do know that we do get droughts, and a couple of months again I had to buy water for my sister because I was sure it [her cistern] was drying out, so I had to go and buy water, which I hardly ever had to do before.

Access to water was a major concern across focus groups and interviews. The USVI does not have large natural aquifers and is dependent upon rainwater and purchased water. People noticed the negative effects of droughts in their daily lives through the degradation of the natural environment. People also experienced drought via the water constrictions they faced in their households and for some through their occupations related to agriculture, which requires large amounts of water for raising crops or animals. People's emotional responses to these experiences will be discussed in more detail later in this chapter.

Changes in Seasons

Nearly all participants also noticed changes to the seasons, including what was once considered a warmer or cooler time of year. Roger, who grew up in St. Thomas reflected, "We no longer wear sweaters at night. If that's one thing when I was young, pretty much nightime

from September straight through to April, you were wearing sweaters at night." Yvonne, an informant stated, "Things are just a little bit more wonky in the natural environment." Yvonne also shared, "Another thing that I credit to climate change is the fruit-bearing season. I see trees flower twice or out of season. That's not the normal season. Fruit tree bearing comes really early or comes at an unexpected time." Several participants specifically referenced changes to the mango season. One participant Maritza recalled:

> I tell my children all the time, I remember when mango only used to grow in summer. Now we are ongoing through December. I know it has to be something that's happening within the atmosphere that's causing our fruit trees to bear or not bear. And so that's one of the main things I've seen with climate change.

Almost all participants noted that the seasons were no longer clearly defined as they had in the past. Mango trees are very common across the USVI, and their flowering being out of sync was noticeable to almost everyone. People's emotional responses to this loss of predictability will be discussed later in the chapter.

Changes to the Shoreline

Some participants also noticed changes to the shoreline due to coastal erosion. Wendy, another informant, also noted "The changes in our shorelines have been very dramatic." Helena, a participant living in St. Croix shared:

> I've really seen a lot of fluctuations at the beaches, the erosion, and the rise of the sea level based upon people who have houses basically on the sea. I know a lady, she's in her 90s, and she's lived in that house probably since the '60s. She said, when she leaves, she knows they're [her family] just gonna tear it down because they're going to have to.

Many participants noticed that the shoreline had moved over time. Beaches are a common location for celebrations and barbeques, so when the beach shifts or the shoreline moves people can no longer enjoy it like they once did. Additionally, for those that live close to the shoreline, there is a likely possibility that they will not be able to live there in the future. Roger shared:

> They [a family he knew] had bought a property, and it was set back from the beach, but after Hurricane Maria, it became beachfront property. Actually, there was a public road to the beach that had been swallowed up by the Atlantic Ocean and St. Thomas isn't getting it back.

Changes to Local Weather Patterns

A few participants mentioned changes they had noticed in local weather patterns. Trevor, a younger participant from St. John, shared his observations:

> There are much lower clouds. It's this strange thing I've talked to a few other people who have observed it, but it's not super widely discussed. But I have certainly seen that … We just had clouds form sometimes, no more than a couple of hundred feet above sea level. And it's not a little wisp of our cloud, it's the actual cloud line is much lower than it used to be.

Another participant, Rachel, noticed changes in St. Croix as well:

> There would be a steady stream of clouds. It would run from basically the east coming up off of the easternmost tip diagonally, right across the island, and up over the north, the northwest. And that cloud cover would come right over, and we were very accustomed to those familiar late afternoon rain showers, and that's a nonentity anymore; you don't see

that. You don't see that steady stream of condensation, and it was a very constant kind of thing.

While not everyone noted seeing these changes to local weather, it is important for creating microclimates across the islands, and especially for providing precipitation. These changes could influence the severity and duration of droughts in the territory.

Warming Water

Yvonne, an informant in St. Croix, mentioned, "The water is hotter than it usually is…which I think is also probably having an effect on our fish population and our reefs." Maritza also noted warmer waters:

I'm going to chime in with the ocean and how warm the fishermen are talking about …You're right, they're having to go further to be able to get a lot of our fish, a lot of the bigger fishes. The reefs are dying out because of the warm water.

Hurricanes

When asked about hurricanes, Jamie a younger participant mentioned, "The only time I can remember talking about climate change in the past few years is just talking about hurricanes." Lola, who was in the same focus group and also younger, said, "The only time when climate change comes up is when hurricane season comes up." Lillian who was also in the same focus group stated, "When we talk about the ocean levels rising, we talk about that, and we talk about hurricanes as separate phenomena. I don't often hear people talk about all of those being related."

Nearly all participants noticed that storms were becoming more frequent and severe, including hurricanes. Helena, who had lived in St. Croix for several decades, described:

> I know Hugo was a [category] five, and I think they said that there hadn't been a huge hurricane of that magnitude since the [19]20s. So you go from not having a bad hurricane until 1989, and then in the next 10 years you may have had more. And not long in between because it was Marilyn and there were several others. And then you have Maria.

Natalie, an informant who grew up in the USVI, said, “The storms are coming earlier.” She meant earlier in the hurricane season than they had in the past. She went on to say, “The way storms have changed some because St. John hardly ever gets hurricanes, hardly ever, so that was very unusual. I don’t know the last time they had a major storm.” Now it appeared that all three main islands of St. John, St. Thomas, and St. Croix were vulnerable to major storms.

Wendy, who grew up in the USVI, shared, “The occurrence of severe hurricanes has drastically increased, and the changes to our natural environment are really powerful.” Ruby, an informant who grew up in St. Thomas, shared a similar sentiment, “If you get five hurricanes in six years you start to pay attention.”

Emotional Responses to Climate Change

There were four main emotional responses to climate change in the USVI that people described. These were a feeling of loss, a feeling of unpredictability, a concern for the future, and a sense of precarity.

Feelings of Loss

Several participants expressed a sense of loss for a time and place that likely would never be again. Roger, a participant who was born and raised in St. Thomas said:

> We've seen dramatic change, and it's difficult to get people to understand because if you've never seen it [the USVI] in its full vibrance, you don't understand what's missing.

> What's there [today], it's beautiful, but through my eyes, it's completely, completely different.

Roger expressed his feelings that people who had moved to the USVI or were born more recently could not appreciate the amount of environmental degradation that he had witnessed in his lifetime. There was a sadness in his voice when it came to describing a past that he loved so much compared to a present where he still appreciated the beauty of nature but not to the degree he once had. Perhaps when one grows up in a place like the USVI, which is known for its natural beauty, this loss is felt more acutely.

Lillian, a participant who grew up on another Caribbean island and was perhaps close in age to Roger shared:

> I do not like to see our coral reefs being killed. As a child, I remember, being able to dive and seeing all those beautiful fish, all those beautiful corals. And now, you go and you don't see too many of them.

For Lillian and others, the beauty of the islands was diminished when the fish and the corals died. While it sounded like she was nostalgic for the past, it also seemed like she mourned a natural world that was no longer the same as the one she enjoyed in her youth.

Jackie, a participant living in St. Thomas, said, "I know that the flamingos are gone; they've been gone for quite some time, and it's just…it just saddens me. It really does." At this point in the focus group, Jackie became emotional and the others in the group consoled her. She appeared to be grieving not only the loss of the flamingoes but also a past that would never occur again. Flamingos were not the only bird, animal, or plant that were threatened by climate change, but there also must be a reflection within people that if all these things die or leave, which they

deeply associate with feelings of happiness in the past, the USVI is no longer the USVI they once knew.

Unpredictability

Related to a feeling of loss was a sense of unpredictability that many people mentioned. Sandra, a participant who had grown up in St. Croix, shared:

> I think the seasons have changed a little bit. There used to be a clear start to summer, and a clear cool season, but they're so intertwined now you can't really tell when one is going to begin and the other one is going to end.

Trevor shared, “Last year, there was a very similar pattern, where the spring wet season that usually is supposed to happen just simply didn’t happen over here [St. John]…the patterns you expect to see are just not adding up anymore.”

Helena, a Black woman who had moved to the USVI from the mainland, said, “ I think there’s definitely been changes because there were certain times of the year that people planted certain things… That I noticed has changed.” Trevor, who was in the same focus group and was also a farmer, agreed, “I can certainly echo what’s already been said about the inconsistency and unpredictability of the seasons now compared to in the past…The schedule that I expected to be able to plant certain crops is certainly disrupted” Roger who grew up in St. Thomas simply said, “Our plants are confused.”

People felt that in the past seasons were more predictable and stable. People knew when mango season was, people knew when to plant certain crops to match the rainy season, and people knew when it would be cool and when it would be hot. The majority of people in the

USVI do not rely on subsistence farming for food, but they do have home gardens that supplement what they eat. When one lives on an island, predictability is a helpful way to feel secure. Many people appeared to long for a time when things were stable and dependable. When people no longer know when a mango tree will bloom, they feel like the natural order is out of rhythm.

Concern about the Future

Participants also described a sense of concern about the future, including major weather events like hurricanes. Lucinda, an informant from St. Thomas said, “A fair sense of anxiety still exists in the community that sometimes is pretty palpable again given the fact that we're really still in recovery from [Hurricanes] Irma and Maria.” Helena, a participant, said, “I think the level of stress that people carrying; there's been a big shift.” People in the USVI had suffered greatly from the hurricanes, and they were still recovering when this data was collected.

Some participants expressed concern about the next devastating hurricane that they would likely experience. Natalie, an informant who had lived through the devastation of Hurricanes Irma and Maria, as well as Hurricane Marilyn in 1995 said, “I'm not going to stay when the storm is coming. I’m not gonna be here. I'll board up and get out. Already I can't do it; I cannot do it.” Her plan was to literally leave the territory the next time a hurricane was predicted to land in St. Croix. She had both the financial resources to do so and family in the mainland that would make it easier to achieve. It reminded me of a conversation I had just after the hurricanes when a resident shared that she planned to fly her elderly parents out if there were warnings of a major storm so that they would not have to suffer through it. Lucinda, stated, “Hurricanes now are not going to be as few and far between as they may have been in the past; I

think that reality has sunk in." Participants seemed to recognize that they had to prepare for the reality of future storms or leave the territory. Their fear seemed to be connected to physical safety.

Precarity

At times concerns about the future were intensified by a sense of precarity expressed by participants. Feelings of precarity seemed most closely related to severe storms and drought. Some participants expressed fear about future weather events and the ways a degraded environment could no longer protect them. Zola shared, "To me, that's [death of the coral reefs] scary because the coral reefs, if there's going to be a tsunami, they're the ones that kind of try to help it from coming on land….It's not good; it's really not good." Zola and others did not feel safe living in the USVI in light of how vulnerable they felt. Aisha also shared, "A couple of months after, I think in 2018, the waterfront in St. Thomas got flooded. The water in the waterfront just went all the way to the Bank Street area. And it was just so scary."

Norma, a farmer in St. Croix and in a different focus group, shared how precarious the future of farming in the USVI was:

> The intensity of heat starting so early on…so I am a little concerned about that. And I see that as a definite, definite problem facing the islands…Even though we [USVI] don't have a lot of agricultural activities, the little that we do have is certainly in question with the lack of rain and without some support. The little that we have, I could see dwindling completely. …We're headed for trouble unless something happens quickly…Crop farming is in trouble.

Wendy, an informant, reflected on changes to the agricultural sector as well:

> And I don't know if the climate had an impact because of droughts, but you know we were self-sufficient with eggs and milk until about the 90s. Well the eggs went away post Hurricane Hugo in ’89, but we lost our milk industry in the early 2000s. And there, it was droughts. These were all grass-fed cattle, so dry [drought] has a huge impact … And here we are now, where we used to have cattle--you know, three or four cattle ranchers for dairy farms--we have none. Our Senepol cattle were developed to be drought resistant, they are unique. … [They have] good meat and are drought resistant, and they're more Senepol cattle in Texas and around the world, and ours just keeps shrinking and shrinking and shrinking. So you know that's a cultural loss that we have.

Yvonne also shared about the precarious situation animal farmers faced due to a lack of water:

> It’s that emergency; that urgency. I have all these sheep; I have all these goats. The abattoir isn’t working, so I can’t slaughter and store meat, and so now I’m responsible for feedback and watering all of these animals, and it’s drought.

Martiza also spoke about how dire the situation was for food production, “99% of our food comes from outside [imported]. You’re eating one shipment away from starvation in the Virgin Islands. If that’s not being a hostage, I don’t know what is.”

Normal described the future of farming as bleak:

> We’re not growing them [food] locally. Not enough is happening. It’s such a loss, a tremendous economic loss. You have a few trying. I try so hard, and it’s a loss. But you keep trucking because you want to. You know how important it is to contribute to the food bank, but it becomes so challenging because of the environmental conditions … I think we have about five farmers under the age of 50 who are seriously considering

> farming, and maybe out of that five, two are really serious about it. So the younger people are certainly not looking at any kind of farming crops or animals. And we'll just go to the supermarket and get all the food. That is a sad commentary.

Jamie also shared a sense of precarity related to drought in terms of not having enough water for the home, "It was a constant concern to fill up the cistern, and not knowing if you have enough water to shower or wash your dishes." Jackie also spoke about the dire water situation for houesholds:

> [Someone was] complaining that twice, this is probably February, she had to buy water. And I said to her, "Why do you think you have to buy water?" I said, "We are going through a drought, and there is no other water. We don't have reservoirs here. We have our systems connected to our homes, and if that dries out then we have to purchase some water."

Many homes in the USVI rely upon cisterns to fill up with rainwater to use for household chores. Without enough rain, the cisterns do not fill up, and without enough water, people questioned how they would be able to survive in the USVI. Norma, a farmer in St. Croix, said:

> The conversation [about climate change] is not in place but should be definitely because we are faced with it, and we see about droughts and what's happening, but we're not following it to the depth that we need to be aware of. I don't think there's enough awareness about what the drought is and what is happening. I think we need to start now because we are headed for a crisis. And I think we will react when we get to that specific point, but we are headed there full force right now, and those conversations are not being had.

In addition to not having access to enough water, one informant also discussed coastal erosion through the lens of precarity. Yvonne said, “People may not be paying attention to it, but we're also losing landmass in the least visible portion. The question is, is St. Croix still 84 square miles of shoreline?*”* People commonly refer to the fact that St. Croix’s is 84 square miles in size, so a change to that would be a change to a central perceived fact about the island. While the islands in the territory are not at immediate risk of disappearing, they are slowly eroding, and for those that were paying attention added to a sense of precarity.

While people under the age of 18 were excluded from the study, Megan did share her work with children:

> They [children] are pretty scared … When we start talking about what the things they can do and what it really means, and is it hopeless. You get into some pretty deep and scary conversations with them because they’re scared about it once they understand the depth of it.

Not everyone felt the same sense of precarity. Some participants expressed a sense of hope for the future. Lillian, a participant, said, “I just don't want to feel hopeless about this issue. I refuse to feel hopeless about it. Yes, things are tough. Things are going to be difficult for us, but I'm really hoping that we can make a change.” Lola, a younger person in the same group shared:

> I don't think you should feel, in my opinion, a sense of hopelessness, because for my generation, like millennials, even though I said earlier on, I tend not to bring it [climate change] up specifically with older groups …But there are a lot of people my age that are

> very interested in it and are lobbying and voting based on it. There are people my age that are probably going to be the next people in politics.

Lillian replied, “With young people like you, I'm very hopeful.” Jamie responded, “I don't mean to contradict you guys, but I am from that same millennial age group, and I do feel hopeless.”

Climate Change Affects People Differently

Although everyone in the USVI witnessed climate change in their daily lives, and many expressed a feeling akin to ecological grief or eco anxiety, not all people were affected the same way by climate change. People’s age and duration of exposure, gender, occupation, socioeconomic status, and recreational use of the environment all appeared to be important attributes as to how people were affected by climate change and their potential emotional responses, including the severity of those responses.

Age and Duration of Exposures

The amount of time a person could reflect upon to observe environmental degradation in the territory seemed to matter. For participants, this was a mix of age and duration of living in the USVI. Everyone who participated in the study observed degradation of the environment over time. Those with a longer time horizon saw a more degraded environment than what existed decades ago. Wendy shared:

> I was born in 1956, and 1989 was the first time in my lifetime that we had experienced a severe hurricane. And my mother who grew up here [in the USVI] and my father, it was their first time. Since then, the occurrence of severe hurricanes has drastically increased and the changes in our natural environment are really powerful. The reduction in rainfall.

> The changes in our shorelines have been very dramatic. The changes in bird life and natural life. A lot of that is impacted by climate change.

Even people who were younger saw a difference in how the environment had changed. Trevor, a participant in his 20s who lived on St. John, chimed in when I asked his group if they noticed changes in sea level:

> I can add on about the ocean, a little bit since I live real close to it. … I was talking to my mom about this… I would mention sea level rise has been noticeable, and I can see, even in my lifetime, … I would say, in the last 20 years the highest high tides of six inches.… I think my mom mentioned that it may be as high as eight inches in her lifetime.… I've seen a lot of the difference just myself in the last 20 years or so, and her time span is more like 60 years, so there's definitely a steep upward trend.

Several participants who did not grow up in the USVI but had lived there for many decades, also remarked that the USVI was different from when they first moved there. Norma said, "It's just a whole thing of dryness that we experience that I have not seen in my 41 years here."

Some participants, such as Wendy and Trevor, had access to intergenerational knowledge to reflect upon even longer time horizons. Wendy shared, "You know they didn't have hurricanes or hurricanes of this magnitude and frequency. My father for sure talks about being a child and wanting to see a hurricane…Now it's like almost every other year there's a hurricane."

Gender

The majority of the participants and informants were women. Two of the focus groups were comprised entirely of women. I asked the women if they thought that gender impacted how people perceived climate change or were affected by it. Jackie shared:

> The people that I know are all female who think like me on this subject matter, who are passionate --and some more passionate than I am about it -- they're all females … I think women are just movers and shakers and making things happen. Because I know for me the introduction to it is definitely my daughter. I wanted her to know that the environment was important.

Maritza, who was in the same focus group as Jackie, also shared her perspective:

> I know that the reason why women are more attuned to it [climate change] in the Virgin Islands. It's because culturally men are responsible for finances and money and that type of stuff. They're not necessarily nurturers of the home. So our nurturing for our children wants them to have a safe environment, wants them to be able to be healthy, and so when we recognize the link between children's well-being and the world that they live in, it starts to become part of what has to happen, something that's really important. … [I want to] ensure that my children's children's children get to enjoy this [the USVI] so my motherhood is linked to my womanhood, and I feel like that's a big part in the Virgin Islands period, our motherhood.

I asked Lucinda, an informant, if she thought that women were more concerned about climate change and if there was a gendered dimension to how people were affected. In response, she said:

> That's interesting. I never thought about it from that perspective. On the one hand, I could understand that; however, I would argue that the majority of our farmers [are men]… Their [men's] focus may not be on their children; they may be looking at climate change more from an economic impact.

I also asked Reina, another informant, if she thought women observed climate change more than men, and she said:

> I can see what they're [the participants] saying, but I don't think that. Many of the men that I know, like my dad and my husband, we talk about climate change. We know quite a few farmers, and again they're primarily men. A lot of my exposure with it [climate change], I think has been more from men.

Occupation

Specific occupations were more directly impacted by climate change events in the USVI. This included farmers, fishers, and people who worked in tourism. Jamie who worked in tourism said:

> From the worker's standpoint, it [climate change] affects tips. When people [tourists] go out there [to the reef] and see that [environmental degradation] -- like everyone hypes up this amazing incredible reef -- and you go out there and it's just a bunch of bleach piles of dead coral. If you go on any of the review websites, you'll see bad reviews saying the coral is dead.

Sylvia, an informant, reflected on the impact of climate change on certain occupations, "People that are tied to the natural world for their jobs, like the farmers and fishermen, those people really see the differences." Lucinda, another informant, stated, "I would surmise that if

you spoke with farmers, and if you spoke with fishermen, they would probably have a lot to say about climate change and how that is impacting their livelihood."

Rachel shared:

> There are as many challenges with livestock farmers because it simply means that first of all hay production is diminished. … Feed grain is an economic deal-breaker so you [livestock farmer] end up having to sell many of your animals before they're ready to be sold because you can't afford to feed them…Our agricultural sector is faced with some real challenges.

Maritza agreed with the others in her focus group that fishermen were negatively affected by climate change, "You're right they [fisherman] are having to go out further to be able to get a lot of our fish. A lot of the bigger fishes and reefs are dying out because of the warm water."

Socioeconomic Status

A few informants discussed the effect of poverty on people in the USVI. Natalie, an informant, mentioned:

> You know there's so many other things that we worry about that we really are not focusing on that [climate change]…I mean we're worried about children killing each other; wondering about whether we have a job … and we still have a fair amount of poverty here too.

Lucinda, another informant, shared:

> You might think, well, I have to struggle to deal with my bills, and I don't have time to do this other thing [climate change] because that requires time. I must do these things that I have to do, so sort of a survival kind of thing.

Ruby also put into context, “60-something percent of our families are single-headed households run by females.” While few individuals spoke directly to their own experiences of living in poverty, it was a concern raised by many, especially informants, as an issue facing the wider community.

Recreational Use of the Environment

Another subset of the population that might have strong emotional responses to climate change are those that rely upon the natural environment for recreation. One participant, Roger, an avid SCUBA diver who was born and raised in St. Thomas, shared how he noticed that the water had become warmer over time:

> When I started SCUBA diving, I found that I needed a wetsuit seven millimeters thick. …I don't use it now. The last three years, I have not used my wetsuit when I SCUBA dive. …The area where I tend to spend most of my time in the water was bathtub warm.

Describing the water as bath water seemed fairly common amongst participants and was not meant positively. Rachel, a participant, also described the water as such, saying, “Sometimes you go to the beach looking to be refreshed, but it's almost like bath water.” An informant, Reina who was a native Virgin Islander and swims almost every day after work, described it as it being “like a sauna.” She noted, “It never used to be [this warm]. I really think it has to do with the climate.” Megan, who had moved to the USVI, shared a similar experience:

> There's a lot of people that snorkel. This weekend I went for a nice snorkel, and it was beautiful and that's my thing that I do, particularly in the summer ... And you can see things like the coral being damaged, and you can see less fish. It's just less comfortable in

> the water. And you're not seeing the things that you usually see, that are kind of exciting to see.

Richard, a participant who had lived in St. Thomas for decades said, "When I got here in the 70s, I would swim at these beaches, and you'd go in the water, and it would be solid fish."

Many of the participants appreciated the natural environment for recreation, though not all participants mentioned it. Both Black and white participants, those that were raised in the USVI and those that had moved there, shared how they enjoyed snorkeling or swimming, and how it was not as enjoyable as it had been in the past. Losing access to nature in this way was also experienced in an emotional way. Participants could no longer find the joy they once experienced while being part of nature. There are likely sub-groups within the USVI that do not swim or snorkel, and they would not experience this loss the same way. Marie, who had grown up in the USVI, said, "I'm not really a beach person, so I wouldn't really notice anything different with the coral reefs." There could also be forms of recreation not captured by this study, such as fishing or hiking.

Summary

The study participants, all residents of the USVI, described their experiences with many different types of climate change-related weather events. All focus group participants and informants described a range of environmental changes that they had noticed over time and attributed to climate change. No participant denied that climate change events were taking place in the USVI. Most participants mentioned hurricanes, drought, and changes to the seasons having worse effects on the USVI over time and affecting them. Many mentioned warmer oceans, especially those that used the water professionally or recreationally. Some participants also

mentioned coastal erosion and changes to local weather patterns, though neither was as commonly mentioned as the other climate change events.

Not all study participants were affected in the same way. The negative effect of environmental degradation on participants appeared to be strengthened by people's time horizon to bear witness and their proximity and vulnerability to climate change events. There appeared to be certain attributes that shaped people's experiences of loss related to climate change in the USVI.

CHAPTER V: CALLS FOR ACTION

This chapter reviews people's observations of what they would like to see done in the USVI to combat climate change. These desires for action could be grouped into four categories: increasing people's knowledge about climate change, holding elected officials accountable, reducing greenhouse gas emissions locally, and making climate justice spaces more inclusive.

Increasing Knowledge about Climate Change

Several participants felt people's attention to climate change in the territory was low. An informant, Natalie, said, "I don't think most people are focusing on it [climate change]." Norma, a participant shared, "They're busy trying to survive." Sylvia, an informant, stated, "We have many [people] below the poverty level. That's where their focus is. It's a day-to-day survival of getting bills paid." Natalie further explained:

> Like I said, there's so many other things that we worry about that we really are not focusing on that [climate change]. I think that is part of what's going on. We're worried about children killing each other, wondering about whether we have a job, and we still have a fair amount of poverty here. People are too worried about whether we can get healthcare on our island, especially here with our limited resources that have not improved. … So we have a lot of concerns and then the pandemic. It's [climate change] kind of far away from us right now; there are more immediate things that we worry about.

Jamie shared a similar sentiment:

> I don't know what to rank it against. It's important, but it's a long-term thing, so there's more important things I'm worried about. I know it's important, but that's not something I'm going to think about because I got other things to worry about.

Many participants still believed that people needed to better understand what is going on, even in the face of these challenges. Yvonne said, "Whether or not it's [climate change] at the forefront, the environment impacts everybody, and that's something that the hurricanes showed us." Aisha explained the need to increase people's climate literary:

> As time progresses, I think we should get more educated about climate change and maybe figure out what we, as a people, could do to prepare for certain things because there are things that we cannot prevent, but we could probably better prepare for some disasters, which may be caused by climate change.

Lola, a younger participant, said:

> I think more education will probably help them [people in the USVI] so they can fully understand. Because I don't think they're not compassionate, they're just ignorant as to where the trash is going to end up, and how badly is going to affect them and their environment.

Jackie, a participant who lived in St. Thomas, said:

> [Climate change] is a subject matter that some people feel as though they are not familiar with, so therefore we have to break it down in terms of the things that they do, their activities, the things that they enjoy, and how are those things being impacted. I think that's the way we have to educate people … If you explain it in terms of their favorite beach, how your fisherman has been going out to get your favorite fish. What does the

> food taste like? Those types of things. What about the drought? How often have you been buying water? What is the cost factor to you? Those are the things that people can relate to, and if you describe those things in that way, then you can bring in the word climate change. That would be my suggestion.

Lola shared a similar concept as Jackie about how to meet people where they were with conversations about climate change:

> To really get people, especially the local community, engaged, you have to tie it into all the issues that we are currently prioritizing because you can, in my opinion, correlate climate change to a lot of the different struggles that locals face, either with agriculture and natural disasters, how we get our energy. So if we could just have that put into the talking points that are already the main talking points for Virgin Islanders, it will be more well-received.

Ruby, an educator and native Thomasonian, shared her experiences educating the public about climate change:

> People will take information if they think it is officially sanctioned. They will take information from people with faces and reputations that they recognize. And they will take information and try to use it if they understand it. You have to speak with them in a way that makes sense… The idea of how you speak to all these different groups; they're not the same. They may be all Virgin Islanders, but they're not the same; they don't have to be, but you have to learn how to speak to them … People are saying that if you want to reach anybody that's between 49 and 12 or 10 you have to do it on social media in some

way. The challenge would be, if what we heard before was that you needed to have authority and recognition, how do you do that, in the mess that is social media?

Lillian, a participant who also worked in education, added that social media is problematic:

> I have to say that one of the things that concerns me is a lot of propaganda that's going on in social media about *climate change is not true, this is nothing, that nothing is wrong*. We have a lot of very young people who are more on social media than some of us. There's enough going on that can help us provide more education and more action on climate change, but we also need to also be aware of this other force that's going on contradicting a lot of the efforts. We need to make sure that whatever strategies that we are trying to put in place… that there's this other force that we need to know how we are going to manage.

Sandra mentioned, "I love the education piece that everybody spoke about, but I think it's important to that we become more aware of our impact on the climate and what we can do to mitigate it." Rebecca , a participant, shared her own isnights into public education efforts:

> People thinking that information leads to behavior change, I think has been proven wrong by the fact that there's an entire generation of people still going to the beach and leaving their trash. That means that the once-a-year Earth Day trash pickup you did [as a student] didn't work. And I think that we should learn from that, and I think that this is not the only place that happens, but I see that, the real commitment and consistency to embedding environmental education. But then there is also, unfortunately, the fact that we don't have time for the entire next generation of people to grow up and then make those better decisions.

Not all of the participants were convinced that it was helpful to use the words "climate change" to educate the public. Norma in St. Croix said, "I think that's left to the level of education or comfort zone, so they don't necessarily use those terms, but certainly they aware of it for survival purposes." Yvonne shared a potential creative strategy for reaching people:

> I can think of a solution squarely centered in education, an appropriately targeted community campaign that makes not just information about climate change, it doesn't even have to mention climate change. It could be driven towards behavior change that helps us lessen the impacts of climate change and have a really cute hashtag. So it's education, it's a community campaign, but it's also an education for our policymakers because even if they know the issue they may not know how to advocate or they may not know what climate policy looks like. So it's getting them comfortable… I'm not just talking about climate change, we're talking about the environment. How do you become an environmentalist. Exposing children to science-based careers. It's the Department of Labor, again intersectionality, workforce development around climate jobs in the region. There's an education piece, there's money and funding for afterschools to get kids out there and doing things, and then it is community organizing. Maybe the campaign is led by community organizers. I do think there's something about making it digestible. I do think there's something about having climate smart block parties. If the revolution was a party, more people would come. Fun days for families. Not if it's a doomsday scenario: *you have to get this information because we're all going to die.* Nobody's willing to come to that. People are very overwhelmed and overburdened, with the pandemic, the

> hurricanes, the economy, the refinery. People can't take listening to one more piece of …bad news.

Educating Young People

Many participants believed that curricula should be revised to include focused efforts to teach young people about climate change through the schools. Lillian, a participant living in St. Croix, said, "I really think the issue of early education is important." Helena also mentioned education:

> What I would like to see is more of an emphasis placed on science, geography, and all of those things about the environment in schools and school curriculums. I do not get a sense, and that's when I'm talking to younger children, like my grandchildren, for example…I just don't get a sense that they're getting a strong background in terms of the environment. Just a good education about nature in general and just basic things … so that they would be better prepared to be able to understand some of the things that we're seeing.

Some people referenced a time when there was more of an emphasis on educating younger people about the environment and how it no longer existed. Norma, who is also an educator, said, "Even in our school curriculum. we no longer have that [climate change] as a major topic of exchange. And we probably need it more now than I did at the time when we were really pushing it." She went on to say, "I think it's a good time to update the topics back to our school level and get our youngsters involved in some of this, and they certainly will take it back home and start that conversation."

Deborah shared that students seemed to be interested in environmental education and said:

> I remember when I started to do beach cleanups … people were not really on board, and then every year I kept doing it for years and, I realized other classes were asking, the students, not the teachers were asking, can we go with you and can we do this?

Some people mentioned specific school programs related to trash pickup that seemed to be very formative experiences. Wendy described the program:

> Thirty-five or 25 years ago -- and it lasted for probably 10 years --we had a really effective anti-littering beautification program. The children, who were getting it from grade school all the way through high school, became the advocates. They checked their parents, checked everybody, and then we eliminated the program so now we've got two generations who have grown up without that. Or maybe even three.

Lola from St. Thomas shared her own experiences in school:

> When I was in the public school system, we might have a Beach Awareness Day, but I found a drastic difference when I went to Montessori where we had, almost every month, to go out and do different little studies in our environmental class about the reefs. We got to go on kayaks to pick up the debris, and I was in the ocean, so I really got to feel the actual connection to what's happening to my island.

Holding Elected Officials Accountable

Many participants stated that political leaders should do more to combat climate change, from Washington, DC to their local elected officials. Natalie, a key informant from St. Croix mentioned, “I want to make sure that our national leadership realizes the impact and is able to

help.” In reference to local politicians, Jackie said, “You don't hear our leadership talk about this subject matter [climate change], as we are talking about it today.” She went on to share, “I don't hear our leadership here in the territory talking about it passionately like I have seen some of the Caribbean islands, who are doing better than the Virgin Islands.” Megan said, “I think there's less commitment here from our elected officials than in other places. And I think that's beginning to show, which is disappointing.”

Yvonne raised, “Public sentiment is still important to our political leaders, and so they could absolutely be building town halls on climate change if they truly understood and were concerned by the impact and that only comes when you're actually seeing a pattern.” Rebecca stated that “The ‘What's in it for me?*’* has to have a short-term, near-term answer for elected officials to be interested in. All of the things we're talking about have a short-term loss in the name of long-term gains.” Megan said, “We have so many pressing issues here that are just immediate and desperate that it's hard to step back from that.”

People had seen interest from political leaders in the past though. Megan shared, “There was a climate change commission during the previous administration that wasn't officially disbanded, but it hasn't been active since.” Jackie said:

> We had the opportunity in 2015 to actually develop a climate change program for the territory. An executive order was put together. … It should have helped the territory to set up a structure to be able to deal with this, which we haven't done in any really focused way.

Rachel mentioned:

> A lot of times our elected officials are going to seemingly target those things that are going to get them votes and get back in, and we're not really looking at those difficult issues in a proactive, preventative kind of way. And then … we end up staring a crisis in the face and wonder what the heck we're going to do.

Nigel had a suggestion for engaging politicians:

> Enticing the politicians to do that [work on climate change] by saying the amount of jobs that will be offered. Jobs are supposed to equal a better, stronger economy and, of course, the public listening to that see opportunities for themselves, as well as employment.

Lillian did not think that it would be easy to politically activate people stating, "Like anything else, having people to be politically astute is always difficult; to become politically active is always a little difficult." Others thought that it was possible, however. Jackie mentioned, "We have to become more active in our political arena because we lack persons who have passion for this subject matter [climate change]." Maritza agreed, "Right? Start voting for people who have the same value system as you. … Our environment I feel like it's a top value. If you don't have it as a top priority, you can't get my vote." Sylvia said:

> I think to look at some sort of a consortium of individuals …to look at making our environment healthier and better, not just for now ... one of the sad things here is every time the governor change and every two years the senators change. Everybody refocuses, reassesses, and so, some of those long-term concerns are lost.

Megan, an informant in St. Croix, also thought it could be valuable to bring people together to act as one. She said:

> Ideally, something like a Commission or a multi-sector group …where you've got people that are experts in those sectors… and communicate to people. And also talk to people and learn about where those effects [of climate change] are going to be … and have conversations about it.

Reducing Greenhouse Gas Emissions

Participants also wanted the USVI to take action to reduce local greenhouse gas emissions. Wendy described the opportunity available in the USVI:

> Our primary source for electricity is still oil and gas, and here we sit 300 or more days out of the year with six to eight hours of blasting sunlight, and there's no policy, there's no plan, for moving to sustainable energy. And it boggles the mind, like okay, why is this not happening?

Natalie shared, “We paid for an integrated resource plan that identified ways that we could at least very much increase our renewable energy sources.” Wendy stated, “You know for a lot of things we’re 10 years behind. Now we're playing that catch-up with technology.” Roger, a participant, was skeptical, “We don't have the infrastructure. We don't have the ability to keep them [green technology] maintained and running and all that type of stuff.”

Some people in the USVI were also aware that the green infrastructure would not just be for residents but for the tourism industry as well. Steve, an informant, said, “But when you start thinking about how the hotels and how the tourists that are here are running those and how they're putting a bad impact on the grid. We have developed this economy that's dependent on tourism.”

People discussed different green technologies that could or have already benefited the territory. Natalie mentioned:

> I don't see why we can't put a wind farm there. I think we are planning to put a wind farm now in St Thomas. There has to be more land that can be used, maybe not in St Thomas as much as in St Croix, that can be used for more solar farms. I was always a fan of what is called water thermal.

Several people raised the need to have local people trained in installing and maintaining green technologies. Natalie mentioned, “We trained a lot of people in solar repairing and installing solar and some of them went into business installing solar, some of them got hired by people who would do, but we have people moving here. You know we're missing out on opportunities.” Wendy also spoke about jobs, saying, “How about the jobs we can create immediately if we start doing something? Those are high-paying jobs, but more importantly, we create opportunities for ownership.” Some people believed that post-disaster recovery efforts needed to further embrace green technologies. Ruby said, “So even if you can't put air conditioning in every place, you really need to make engineers and people work in a way to help to cool down that space some kind of way.” Natalie concurred:

> There would have to be other ways that they think about in construction and in how the buildings are laid out to take into account the need for better cross-ventilation to mitigate the effects of the increased temperatures…We were committed to reducing our greenhouse gases … but I think we realize that no matter what we do, we're just a small blip.”

Not everyone thought that green investments were promising opportunities in the territory. Roger raised:

> I don't know what's going to happen regarding the power situation, but the climate solutions that we talk about, I don't see how they're going to work here. We're going to continue burning fossil fuels for all the cars and whatnot. How are we going to switch to electric?

Household Green Investments

Some people raised how they adopted (or wanted to adopt) green technologies for themselves, such as electric vehicles or solar for their homes, and some of the challenges they faced including cost and an unreliable energy grid. Lillian mentioned how her family discussed adopting greener technologies, stating:

> And there's more discussion in our family about looking at getting into solar. We do have some solar usage in our family, so we do have some awareness, but I think it's increasing at least among my family members, or should we be changing our cars to electric cars.

Sylvia, an informant, stated that she was looking for an electric vehicle as well, “You know our next vehicle is going to be a hybrid because, even with electricity, if the power goes out, you're stuck, so you have to be able to get gas.” Steve, who directed a nonprofit and had moved to the USVI, compared living in the USVI to the mainland:

> It's very expensive to get solar power here. I will tell you the quote for my house, which is maybe 1,300 square feet. The quote to do solar here was $70,000. So, I don't have solar. I’m working toward it. The median income level here is $32,000 a year or

somewhere around there. You can't tell me; you know that two-year's worth of salary is what I need to put solar panels on my house and expect I'm going to take you seriously.

Natalie stated, "I think any changes that are made, like solar panels for the regular individual, is just to reduce the cost of electricity. It doesn't have anything to do with reducing greenhouse gases or anything like that." Steve also mentioned:

> We have an antiquated energy company running on oil that charges six times the amount of the highest energy company stateside. My electric bill every month for this very same 1,200 – 1,300 square foot house is over six hundred [dollars]. … It's not like I'm running air conditioning units 24/7.

Creating More Inclusive Spaces for Climate Action

Several participants stated that environmental justice spaces in the USVI seemed to be predominantly white spaces, and they wanted to see this changed. Wendy, an informant, said, "The public face for the environmentalist has been Americans who were white and wealthy." Speaking about environmental groups, Lola, a young Black woman from St. Thomas, said, "I don't see too many locals besides myself in these groups." Norma, a Black woman who moved to the USVI said, "You see the environmental groups and those things are lily white. And then you don't get invited to be a part of it." Maritza, a Black woman who was raised in the USVI, said, "All the time you realize that a lot of our white allies don't understand how privileged they are." White participants were also aware of this problem. Steve, a white man, who had moved to St. Croix, said, "The whole shift has to come from the majority and not another colonizing source. I would not stand up on the stage and talk about climate change here."

Lucinda, an informant from St. Thomas, said, “I see that it seems like it's mostly white folks who are doing that [environmentalism] now. I don't know if it's because they have more time, they have more resources, they don't have the day-to-day struggles.” Yvonne, an informant in St. Croix, shared:

> I think that a lot of people attribute topics that have to do with the environment period, not just environmental justice, in the Virgin Islands as a very white space. I think in itself that's a very racist idea. Where it may not be systemic racism, it definitely shows our own prejudice against ourselves. What you're telling me is, if you were born in the Virgin Islands and you are Black, you don't care about turtles, sand, the beach, or birds? You have no interest in clean air, you have no interest in drinking healthy water, and the thing that makes it that way is the color of your skin? I absolutely think that there are people who live here who don't care about those things. And I think that they fall into every race. And I think that there are absolutely people here who it's a priority for … and that has been a predominantly white space.

Not everyone shared an analysis of why the environmental spaces were mostly white, which could be related to my being a white person.

Summary

Participants expressed a desire to see actions in four primary areas: increasing the public’s knowledge of climate change, holding elected officials accountable, reducing greenhouse gas emissions, and making climate justice spaces more inclusive. People also highlighted a need to make environmental spaces more inclusive. There was a good deal of variation in what people wanted to see under those four themes. In the next chapter, I further

discuss these findings and those described in Chapter 4, compare them to the existing literature and theoretical frameworks, and provide recommendations for further study.

CHAPTER VI: DISCUSSION

This study sought to better understand how people in the USVI witness changes to the environment over time that they attribute to climate change and the emotional effects of those changes. The study also set out to better understand what actions people wanted to see to mitigate the negative effects of climate change in the territory. While all participants experienced climate change, not everyone experienced climate change the same way. Many participants experienced loss and anxiety related to the myriad changes in their environment. Some also experienced a sense of unpredictability and precarity. Participants' experiences were informed by age and duration of exposure, gender, occupation, socioeconomic status, and recreational use of the environment.

I sought to investigate a USVI experience of climate change. I anticipated that most of the participants would be Afro Caribbean and born and raised in the USVI. There were more white people who participated than I expected, including both those who had moved to the USVI and those who were born and raised there. Future research could specifically explore Afro Caribbean experiences, as Black perspectives and emotional responses to climate change are not well represented in the literature.

There was very little literature on the experiences of people who reside in the Caribbean and nothing was found specifically for people who reside in the USVI (Macpherson & Akpinar-Elci, 2013; Stancioff et al., 2018). In general, emotional responses to climate change remains an emerging area of study that is undertheorized, and so this study adds to the discourse in an important way by including a new geographic location and population. Climate change is experienced in place-specific ways, and scholars have called for research in diverse locations and

populations (Galway et al., 2019). This study is also unique in that it included the voices of both community members and community leaders from the Caribbean. A previous study found that engaging community leaders was a challenge because they did not believe they had the expertise to discuss climate change (Springer, 2020). At times in this study, community leaders also noted that they were not climate change experts, but they were experts in how their communities experienced climate change.

To my knowledge, this was the first study of people's experiences of climate change in the Caribbean that was conducted virtually using Zoom. This could potentially open up lots of new locations to be sites for climate research, though there should be thoughtful caveats about engagement. This might include ensuring that trusting relationships are established and that the researcher understands the context of the place, especially if they have never visited the location. Although I was not physically in the USVI for the data collection, I had been there many times, including after Hurricanes Irma and Maria, and I could visualize what people were sharing. Without my existing relationship with people and the place, I am not sure that the study would have been successful virtually. A prudent approach would be to weigh the pros and cons of in-person versus virtual data collection.

Although Zoom allowed for this study to take place during a pandemic when travel for data collection was not advisable, it had advantages and possible disadvantages. Some of the advantages were that people were able to join for just the Zoom session, and they did not have to travel to a location for a longer period of time. Zoom also allowed people from different islands to be in the same focus group, which would not have been possible if the study had been completed in person. It was interesting because the attribute of where someone lived did not

seem to shape their awareness of climate change or its emotional effect on them. This could be further investigated to compare differences across islands by having focus groups homogenously comprised by island of residence. A potential disadvantage was that technology like Zoom acted as a barrier for those who may have participated if the study was completed in person.

This study adds to the few existing studies in the Caribbean, as well as the wider literature on people's experiences of climate change and its impact on their emotional well-being. While the location and population were different, the findings resonated with findings from other communities and geographic locations, largely that people do experience loss and concern about the future related to climate change threats.

Witnessing Climate Change

The weather phenomenon that people described largely parallels official reports of the major climate change threats impacting the USVI (Environmental Protection Agency, 2016). This includes hurricanes, drought, and rising sea levels, which is similar to other findings from the Caribbean (Altschuler & Brownlee, 2016; Springer, 2020; Stancioff et al., 2018). Additional weather events were raised that were not represented in official reports on the USVI including changes to local weather patterns. While this has not been documented in reports for the USVI, it has been noted in other locations like the Gulf Coast (Shao & Goidel, 2016). People also described several different types of climate change events that happened simultaneously or concurrently. This stacking of exposures and their cumulative impact, especially over long time horizons, is potentially important to track, which was also represented in the literature (Hernández-Delgado, 2015; Mora et al., 2018). Additionally, participants described acute events, like hurricanes, as well as more chronic climate events, like warming oceans, which also is

represented in the literature (Berry, Bowen, et al., 2010).

Most of the study participants and informants were women and tended to be older. This potentially means that younger people, especially those under age 18 who were excluded from the study, could have different experiences and emotional responses. Men, who were underrepresented in the study, could also have different experiences not reflected in this analysis, including the climate stresses on certain occupations like farmers and fishers.

Race

While this study was originally conceptualized to better understand the experiences of people of Afro-Caribbean heritage, several white people participated and may have represented different views and experiences. I approximate that five of the participants were white, representing nearly 30% of all participants, while approximately 70% appeared to be of Afro-Caribbean descent. Two of the focus groups appeared to be comprised entirely of people who were Afro Caribbean though. In terms of informants, again 70% appeared to be of Afro-Caribbean descent. As such this study reflects the experiences of people who live in the USVI, and not just that of Afro-Caribbean participants. Census rates are slightly higher for Black residents of the territory than participants in my study (U.S. Census Bureau, n.d.)

When asked about how race impacted people's experiences of climate change, participants mentioned that environmental justice spaces felt very white and not welcoming to Black people. People did not explicitly state that Black and white people had different experiences of climate change or different emotional responses. Race was not entirely absent from the data, but it was discussed in a subtle and nuanced way. In the USVI, race intersects with other social experiences. For example, when discussing poverty, some informants shared about

the high rate of single mothers, the majority of whom are Afro Caribbean.

In addition to poverty being a proxy for race, culture was also raised as a potential proxy. Participants and informants did not explicitly talk in much depth about the ways climate change affected cultural practices, which surprised me. It appeared to be difficult for people to conceptualize or talk out the topic. Perhaps the problem was in the way I asked about it. One informant mentioned that culture is fluid and she described how Afro Caribbean Virgin Islander culture had absorbed cultural traditions from nearby islands, such as dances for carnival parades and music. She shared that climate change was now part of the content of songs that people wrote and played. She also shared that some of the traditional foods and medicines that had previously foraged from the "bush," which was increasingly disappearing due to both climate change and development. While all people in the USVI experienced the joys and challenges and living on an island, and there is a threat to Virgin Islander cultural practices related to climate change, there seemed to be something particular to the Black experience that was not completely explored in this study. The USVI is a predominantly Black population, and so the degradation of the environment can be a threat to identity and traditional ways of living. When the coral dies, when the coastline erodes, when the coconut tree falls down, there is likely a nuanced way that an Afro Caribbean Virgin Islander experiences it.

Age and Duration of Exposures

At all ages, participants described emotional responses of loss and concern about the future. There could be variation in these experiences, however, that could be the subject of future research. Chronological age appeared to be an important attribute that shaped people's experiences of climate change because older individuals had decades of experiences to reflect

upon. I was surprised by the intergenerational stories of climate change. Family knowledge was passed down from family member to family member. Participants described how environmental degradation was worse now than ever before, and participants validated this claim with stories from their parents and grandparents.

In addition to chronological age, it may be important to consider years of residence in a place like the USVI. Migration has shaped the cultural fabric of the territory and the people that live there. As this study confirmed, there are many different types of people living in the USVI. There are people who have lived in the territory for generations and represent a rich Afro Caribbean culture. Some people relocated from other Caribbean islands, either themselves or previous generations of their families. These individuals have many shared cultural traits with Black Virgin Islanders, and through the generations have also shaped local culture. For those that migrated themselves, their home islands also faced many of the same climate change threats as the USVI. Other participants migrated from the mainland and had lived the majority of their adult lives in the territory, even raising their own families there. These participants were both Black and white. The majority of the participants who had migrated to the USVI had a longer time horizon to look back upon than the younger participants who were born in the USVI. Not many younger people (under age 30) participated in the study; one was a Black woman and two were white men. Additionally, people who were born and raised in the USVI also shared experiences of living away from the islands, typically for educational or professional pursuits. This meant that people's time living on island varied.

Most of the study participants and informants appeared to be older, and most had lived in the USVI for the majority of their lives. While this study was not conceived of as a study of the

experiences of older adults, it provided useful insights into those experiences. Experiencing climate change events over a longer duration and experiencing many of these events in one's lifetime seemed to inform people's experiences. There could be a cumulative effect of experiencing so many types of climate threats over decades. The literature on older people's experiences of climate change was nearly non-existent. One informant thought that perhaps older people experienced less anxiety about climate change than youth because they may believe that they have less of a future to be anxious about. Older adults may in fact experience anxiety and fear about more proximate threats, such as the next severe hurricane. Older Afro Caribbean participants also shared that the loss and grief they experienced were not exactly the same as people who have migrated to the territory or younger people.

While people younger than 18 were excluded from the study, it would also be worth exploring how their experiences compare to adults as they may have different experiences (Clayton et al., 2023). Increasingly, young people are becoming the focus of studies as they are coming of age during the climate crisis and likely will have the longest to live with it, which presents them with existential crises not experienced by previous generations.

Gender

The majority of the people who participated in this study were women. Researchers have previously called for additional research on the interplay of gender and climate change (Galway et al., 2019), including in island contexts (McNamara & Westoby, 2011) and also specifically in the Caribbean (Stancioff et al., 2018). Some participants believed that the woman's role in the family, including as a mother, shaped the way they experienced climate change and its effects. One participant stated that a mother has concerns for the future because it is the world that her

children will live in.

There also seemed to be important ways that class and educational attainment shaped some women's experiences of climate change. Some women in the study were highly educated, especially informants, and relatively secure financially. Women-identified informants spoke about how their personal friendship groups were comprised of highly educated women who did discuss climate change's impacts in the USVI at length. This could indicate that educational attainment will be an important element to consider. There is also a large portion of women in the USVI living in poverty. No one self-revealed during the focus groups that they were living in poverty, and this is perhaps another group that should be the focus of future studies as they could have unique experiences not reflected in this analysis.

Women's role in the family also could play a role in how they think about climate change and are impacted by it. One woman described that in traditional USVI culture, women were seen as having the primary role of mother. This traditional role could inform how women relate to climate change and its potential future negative effects on their children. Some of the participants suggested that women talk about and experience climate change differently, but not everyone agreed. One women-identified informant described that she discussed climate change mostly with male members of her family. Some of the women thought that there was a gendered element to how people perceived and were impacted by climate change; future studies could delve into this more fully. There may have been several reasons why men did not participate as much. I asked participants and informants how they thought gender influenced people's experiences of climate change. My position as a male may have shaped some of the discussions.

Occupation

Based on the literature and the findings from this study, certain occupations appeared to be more affected by climate change than others. In this and other studies, farmers and fishermen were identified as among those most affected (Berry et al., 2011, 2011; Ellis, 2016; Kent & Brondo, 2020; Rhiney et al., 2018). This study also showed that the negative economic impacts of climate change on these professions were a potential source of stress (Berry et al., 2011). Whether it's a declining tourism sector because the natural environment is no longer the pristine destination that tourists expect or severe drought making farming extremely difficult or warming oceans that deplete fish stocks. These three industries stuck out as being negatively impacted by climate change in the USVI and the people who work in them may be experiencing related levels of stress. They may also have concerns about their industries no longer being viable in the future.

Socioeconomic Status

There is not much literature on the experiences of people living in poverty and climate change. At the macro level, however, there is a general consensus that less developed nations are more vulnerable to the negative effects of climate change (Adger et al., 2003). In this study, no one self-identified as living in poverty, although one younger white male participant raised how precarious his income was and how expensive housing was. People who are already socially vulnerable may be at a higher risk of climate threats including negative emotional responses. Some informants thought poverty was important to consider within the context of the USVI, as the poverty rate is high and affects much of the population, especially Afro Caribbean people. People living in poverty generally have fewer resources to mitigate the harmful effects of climate change and do not have the finances to move to the mainland. They are also likely to be dealing

with more immediate and proximate concerns than climate change, including paying for housing, utilities, and food and water.

Recreational Use of the Environment

Studies showed how important access to the environment was for Indigenous communities, including for recreational reasons (Cunsolo Willox et al., 2012; Durkalec et al., 2015). Recreational use of the environment has also been shown to bring pleasure and solace to different populations (Marshall et al., 2019). The study supported that this is true for some people in the USVI. A participant and an informant both ended the sessions by saying they were going to parties at the beach. Many people shared how snorkeling or swimming was one of their favorite ways to recreate. Several mentioned how they had witnessed coral degradation over the years, and how that made them feel sad. While this study was not specifically about reef grief, it seems to have similar findings (Marshall et al., 2019). Not all people use the environment recreationally, however, which may be an important distinction.

Calls for Action

This study did not originally set out to understand better what actions people wanted to see happen in the USVI to address climate change, but it arose naturally and was mentioned as important by participants. Consequently, I added a research question to continue the inquiry in other focus groups and interviews. Political action is an element in the Environmental Distress Scale (Higginbotham et al., 2006) and fits within the tradition of this research. While this study was not designed with Participatory Action Research models in mind, I was responsive to the requests of the participants.

The calls for action that participants raised reflect many efforts in other places,

nationally, and globally. People shared that they felt like the USVI was behind other places and that they thought they might be forgotten in national plans. The literature also supported public education on the issues of climate change and for youth in particular (Rousell & Cutter-Mackenzie-Knowles, 2020; Shapiro Ledley et al., 2017). In the focus groups and interviews, people shared that did not think that most people had basic climate literacy in the territories. Surprisingly to me, there were people who participated in the focus groups who had in-depth knowledge of the science of climate change, but this was not true for most participants. Basic education on climate change could help people better understand what is taking place in the environment around them and inform mitigation and adaptation plans.

There was also literature that supported the accountability of political leadership related to climate action (Mees & Driessen, 2019; Quayle et al., 2020). Some of the most impactful actions will need legislative and policy changes. This could be increased regulation of companies emitting large amounts of greenhouse gases or support most impacted industries like agriculture and fishing. In terms of upstream solutions, reducing greenhouse gas emissions is also a national, Caribbean, and global priority (Dutta et al., 2023; Koengkan & Fuinhas, 2020; Shah & Niles, 2016). While the USVI is not responsible for most of the harm associated with greenhouse gases, people felt that they could still be part of the solution locally. This study also brought up the problem of the whitening of environmental spaces for full participation in climate actions and responses (Fernandez et al., 2021; Gibson-Wood & Wakefield, 2013). Most of the participants and informants thought that environmental justice spaces were mostly white spaces and that they needed to be made more inclusive. Some informants raised structural reasons that impacted people's ability to participate, such as working and raising families. One informant who was

born and raised in the territory believed that there were Black people in the USVI, like herself and her friends, who did not face those barriers and could be part of those spaces. A participant who was a Black woman and had migrated to the USVI from the mainland also shared that environmental spaces did not feel inclusive. This could indicate that there are things that need to be addressed so that all can join and feel welcomed and safe. Addressing this issue will allow for all to join in the response to the climate crisis.

The calls for action raised by the participants mirror many things that are happening in other places in the country, the Caribbean, and the world to mitigate the harmful effects of climate change. In order to operationalize them, there will certainly need to be governmental resources, coalitions, and plans. Future studies could use a Participatory Action Research structure and dive deeper into what future people in the USVI would like to see and what policy agendas would be feasible, including mitigation and adaptation plans.

Contributions to the Future Development of Theoretical Frameworks

Findings from this study could help inform future theoretical developments in this emerging area. There seemed to be a relationship between the specific climate change exposure, the attributes of an individual or membership in a sub-group, and the type and severity of their emotional responses. The calls to action that people shared also seemed mitigating factors.

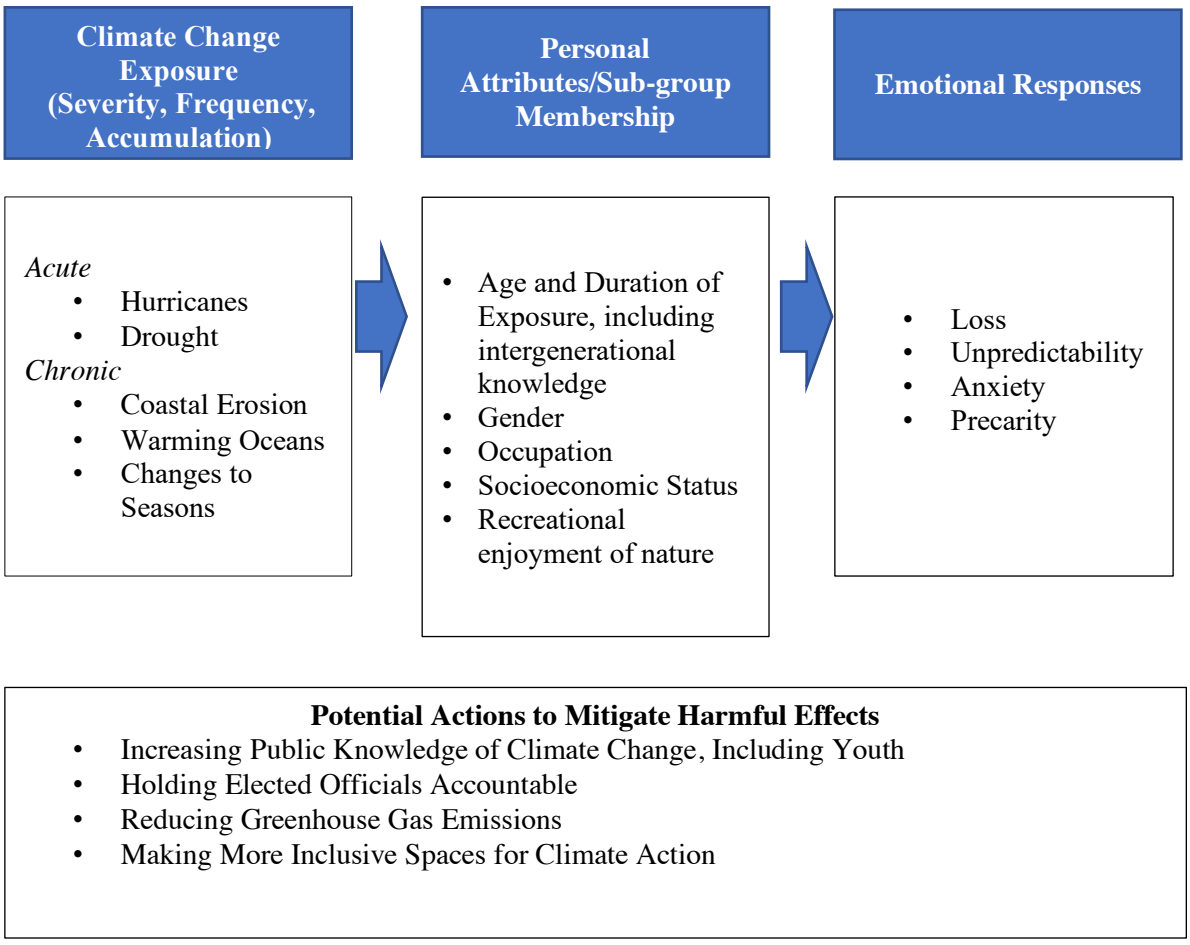

Figure 1

Potential Framework for Emotional Responses to Climate Change

This study looked at all of the climate threats that people experienced in the USVI. Climate events could be categorized as acute and chronic. Acute events like hurricanes happen once, while chronic events would be experienced over a prolonged period of time, such as warming oceans. The immediate impact of an acute event and a chronic event could elicit different emotional responses in people. From this study, it seems likely that acute events

increase people's level of anxiety about the next time such an event could happen. It also seems likely that chronic events can elicit an emotional response of loss from individuals as they witness the degradation of the environment over a longer period of time.

While this study was not designed to fully substantiate if personal attributes or sub-group membership resulted in a person experiencing climate change events differently or if they had different emotional responses. It seemed likely that both are true. For example, warming waters seemed to most affect people whose occupations were linked to the sea, such as fishing or tourism. These financial stressors seemed to elicit an emotional response of anxiety in these groups. What became clear during the study was that people that live in the USVI are not a monolith and variation will be important to look further into in future studies.

Additionally, actions were identified that could potentially mitigate the negative emotional responses related to climate change. One upstream potential solution would be to lessen climate change itself via a reduction in greenhouse gases. While the USVI does not emit as much greenhouse gas as other places, it could be part of the solution locally. Beyond lessening climate change itself, public education and general awareness raising could help people better understand the emotional responses they are feeling and lessen their negative effects on their daily lives. This could include educating young people in the schools so that they could become more aware and hopefully resilient since it is likely that they will spend their whole lives facing extreme climate change events. Lastly, making more inclusive spaces could help to empower people to take action against climate change. This would be to ensure that spaces for action are not dominated by some and make others feel unwelcome. The severity of the climate crisis will need all of society to be involved to respond.

Limitations

There are inherent limitations to using focus groups and interviews to gather data. Potentially the data was biased as participant responses were shaped to please the researcher. I took several steps to mitigate this phenomenon, including memoing throughout data collection and analysis, discussing emerging findings with key informants and other scholars, and integrating their feedback into the analysis.. Despite these limitations, this study provided the opportunity to amplify the voices of the USVI residents, who shared the richness of their experiences. Further, as emotional responses to climate change is still an emerging topic, a qualitative design and grounded theory approach provided an unprecedented opportunity to advance knowledge in a critically important field.

Finally, the COVID-19 pandemic presented a major challenge to conducting this study, including the necessity that data collection be completed virtually. However, participant recruitment was fairly easy, and the data collected was quite rich. This may be due to the fact that people have become more accustomed to virtual engagements via platforms like Zoom because of the pandemic.

Other Ways of Knowing

An unnamed Indigenous scholar challenged Galway and colleagues (2019) to reflect on the role of culture in shaping people's experiences of loss. The scholar questioned if concepts like solastalgia are Western notions and if they were applicable to non-Western communities. The scholar also suggested that Indigenous ways of knowing may better reflect Indigenous people's experiences, labeling those experiences with Indigenous words from their own

languages, which might be lost in linguistic or cultural translation. Instead of trying to fit these new terms like solastalgia onto all people's experiences, perhaps it is best to listen to how different communities describe their own experiences. The field of Traditional Ecological Knowledge is a useful reference for such work (Barnhardt & Oscar Kawagley, 2005; Gómez-Baggethun et al., 2013).

My own study set out to understand people's emotional responses to climate change in the USVI and if concepts like solastalgia, ecological grief, and eco anxiety matched the experiences of people in the USVI. In several ways, it did seem that people in the USVI experienced ecological grief and eco anxiety. As an initial study in this area, the question remains unanswered if there is a uniquely USVI, or Afro-Caribbean way of knowing these effects that are influenced by history (including slavery and colonialism) and culture.

Implications for Future Research

Within this still-developing area of research, there are many opportunities for future studies that can to add to our understanding of these phenomena and processes. It would be worthwhile to conduct the study as originally designed with in-person data collection. Being on island might also allow for people to participate in the study who do not feel comfortable using Zoom or would prefer an in-person experience. Several people suggested that I work with AARP to gather feedback from older adults. An on island study might also facilitate more participation from people who are facing multiple daily struggles, such as living with poverty, through creative engagement strategies or by providing childcare during the focus groups and holding them at a convenient location.

In-person data collection would also allow for the use of more immersive strategies

aligned with ethnography, such as participant observation or PhotoVoice (MacFarlane et al., 2015). Observation could be important to better see how people witness climate change and their emotional responses. As part of the introductions at the start of the focus groups, participants were asked to share their favorite place to be in nature in the USVI. They shared many different places in the natural environment that brought them joy. This opening exercise revealed how special the natural environment was for participants and how much they appreciated living in a place like the USVI. I could easily imagine a PhotoVoice project where participants were asked to photograph a place that brought them joy and changes they have noticed. Some studies have used walks ("walking interviews") for people to show the sites of climate change in their lives (Evans & Jones, 2011; Phillips, 2022). I could imagine a "walk" taking the form of a boat ride with a fisher or a swim through the coral. It would also be interesting to do more longitudinal studies by spending a sustained amount of time with individuals to see how climate change impacts them during different seasons. This study was only conducted during the summer months. At different points of time throughout the year people may feel more intense emotional responses to different climate threats.

My study indicates that Participatory Action Research might be a good tool to study this topic in the USVI (MacFarlane et al., 2015; Mapfumo et al., 2013; Smith et al., 2023). As mentioned previously, I was responsive to initial focus groups and included an additional research question on people's desires for action to address climate change in the territory. People naturally appeared to want to talk about solutions and not just the problems associated with climate change. I can imagine a whole workshop that just focused on actions that people wanted to see taken in the territory. The research questions could be written in concert with the

participants and be truly participatory. Decolonial research methods should also be considered for conducting research in the USVI.

This study intentionally had very broad inclusion criteria, and future studies could focus on specific sub-populations to better understand their experiences. While I reached out to people who earned their livelihood from fishing, no such residents participated in the study. Only a limited number of farmers participated, and only one participant worked in the tourism sector. It would make sense to focus future studies on these occupations since they are severely impacted by climate change.

Future studies in the USVI could also focus on young people or older adults as discreet populations. It would be especially interesting to focus on people under the age of 18 since they were excluded from this study. For older adults, it would be interesting to complete narrative studies, especially those with family history in the USVI to see how things have changed over a longer time horizon. It could also be interesting to study those individuals who grew up in the USVI during a time when there was a focus on environmental literacy and beach cleanups and see how that has informed their current world views. Additionally, since so few men participated, it might be beneficial to attempt to recruit more men as participants in future studies.

This is also one of a few studies that focused on the Caribbean. There are opportunities to do similar studies in other Caribbean locations, potentially that are dissimilar in some ways to the USVI. This could be Puerto Rico which is a larger island with a greater population and potentially a different cultural perspective. A future study could also look at the experiences of the USVI diaspora living in the mainland and dive deeper into their experiences of climate

migration. As an outsider to the USVI and the Caribbean, I am also interested in undertaking studies like this where I live, in Brooklyn, New York.

Implications for Policy

This study demonstrated that participants had suggestions for policy changes in the USVI, which have already been covered in Chapter VI. Participants had direct recommendations for elected leaders, including integrating climate change into school curricula and educating the public more generally about climate change, as well as greater investments in green technologies to reduce greenhouse gas emissions in the territory.

National and global policies should prioritize the reduction of greenhouse gas emissions to protect places like the USVI from climate threats. Small island nations have shaped how global leaders think about their responsibilities beyond their borders. These voices should continue to lead discussions about climate change, including voices from the USVI.

Policies at the national level should respond to the needs of the communities most affected by climate change. This should include not overlooking or unintentionally excluding territories from national policies. Many participants feared that decision-makers would once again not include the USVI in national conversations about climate change despite being one of the most impacted locations in the country and least responsible for causing climate change. Territory-level programs and policies should also make sure that the concerns of the most vulnerable in the USVI are taken into account. These should inform the development and implementation of mitigation and adaptation strategies locally.

Additionally, policies and related programs should be developed to address the mental health effects of climate change. The federal government should establish a climate change

mental health climate corps to begin to build and train the mental health workforce needed for the future. Ensuring that people have access to appropriate mental health care is critically important, especially for youth, as they make sense of the climate crisis. Mental healthcare associated with non-pathologized experiences of climate change need not mirror the medical or professional models. They could instead prioritize community care, focus on upstream causes of inequities, be peer-driven and culturally competent, and be responsive and accountable to the community. Again, the territories should be potential sites for such a program.

The USVI could become a model for the nation of what successful climate change policies look like, and these policies could be translated for other locations across the country. This could include places in coastal areas that are subject to flooding, southeastern parts of the country susceptible to hurricanes, places in the Western United States that are subject to wildfires, or places like Alaska that are also experiencing changes to the environment related to climate change where people have a lifestyle that is very connected to the outdoors, either for Indigenous communities or those that have moved there and lived there for generations.

Implication for Social Work Practice

While it is important that social work has outlined a Grand Challenge related to the environment, it can do more (Uehara et al., 2013). Social work should unite in calls to protect the environment and the people that live on this planet. Social work also must commit as a profession to reducing its own greenhouse gas emissions. The climate crisis calls for bold actions, and social work must advocate for change. Social work can continue to shape future directions that are grounded in social justice, which is not always central to climate change plans and discussions. In addition to our role as mental health providers, we are also community

organizers. There is clearly a role for community organizing to gather communities to determine how they would like to address the challenges associated with climate change, which will need to be location specific.

Social work can and should do more to address the emotional needs of people most impacted by climate change events. As a profession, we can help to shape the conversation and help to design and implement the interventions. As mental health practitioners, social workers should be aware of the potential effects of climate change on their clients' well-being. It would also be advantageous for social workers to be familiar with emerging concepts like solastalgia, ecological grief, and eco anxiety so that they can better assist their clients. Social workers should also consider training options to better understand the unique needs of populations most affected by climate change, such as Indigenous and Afro Caribbean communities. As loss and experiences of grief can be culturally specific, social workers should not adopt a one size fits all approach. We need to meet clients where they are and educate ourselves to be better prepared to work with them. To that end, social work should also put forth resources to support practitioners who are from those communities, as well as to support education systems that train people from those communities.

In addition to community organizing, advocacy and mental health, social workers fulfill the key role of providing referrals within organizations for clients, such as hospitals or social service organizations. Social work should develop screening tools related to climate change and identify resources that can assist people. Social work should shape a framework that connects climate change assets with the needs of clients, such as community cooling centers or help applying for the Low Income Home Energy Assistnace Program. This climate change screening

could be very similar to what social workers currently do to screen individuals for the social determinants of health, such as housing or food insecurity, and quite possibly could be integrated into existing workflows.

Implications for Social Work Education

As this is an emerging field, climate change and its impacts on clients have not been fully integrated into the professional education of social workers. As climate change is one of the greatest challenges currently facing humanity, social work schools should begin to adapt curricula to integrate climate change components across courses and curricular areas. This may also require retraining those who educate social workers, who may or may not have the expertise of relevant knowledge and skills. Changes to social work curricula might include educating students on eco anxiety and ecological grief as more populations are likely to experience these over time. This could also mean that social work schools develop specific tracks for climate change-related specialties. There are some schools that have already begun to specialize in natural disaster responses, so this could be an extension of that work.

Social work schools should continue to interrogate what they mean when they say, "person in environment" and consider more than just the social environment as impacting people and communities. Social work schools might develop practica that focus on exposing students to climate change work. For example, I have a Master's in social work intern in my office and have integrated them into our collaboration with the Office of Climate Change and Health Equity. They have taken a lead role in drafting a referral guide for providers related to the social needs of people who experience extreme summer weather, such as programs that support air conditioning or home weatherization programs. As we can and should lead in the psychosocial impacts of

climate change as a profession, we should also lead in educating the next generation of professionals. This should include taking them on advocacy days to elected officials to ask for changes to be made at the macro level.

Conclusion

There is no denying that people in the USVI experience climate change. All participants experienced many types of climate change threats simultaneously and over a long duration. Participants from this study experienced feelings similar to ecological grief and eco anxiety, consistent with studies with other populations and locations across the world (Coffey et al., 2021; Comtesse et al., 2021; Cunsolo Willox & Ellis, 2018). People in the USVI also want to take action to mitigate the harmful effects of climate change in their home islands.

This study contributes to what we know about how people, specifically USVI residents, are affected emotionally by climate change. People in the USVI experience a sense of loss related to the degradation of the natural environment, and some also experience an unsettling sense of unpredictability about their home islands. Many are unable to derive the same sense of solace that they did in the past. Additionally, people are concerned about the future and feel anxious about it. For some, there is an acute feeling of precarity in their lives that is stressful and a direct result of climate change. Future studies could help to further understand if theoretical constructs are confirmed by the experiences of people in other places. These emotional responses may be influenced by the type of climate change events someone experiences, including if it is an acute or chronic event. Additionally, people's emotional experiences may be shaped by their age and amount of time living in the USVI, their gender, their occupation, their socioeconomic status, and if they actively use nature for recreational activities. It is likely that race is also an

important factor shaping people's emotional responses, and further studies are needed to investigate this.

While this area of inquiry remains understudied and undertheorized, this study helped to advance the scholarship with a new location and population. Climate change is currently the most critical crisis impacting humanity, and we need to leverage all opportunities to better understand its impact across all domains. Social work research is an important contribution to this field, as we have a unique point of view that is not fully represented. More studies are needed to ensure that communities like the USVI are not left behind in national plans to address climate change; our profession demands it, and the moral compass of the universe compels it.

Appendix A: Institutional Review Board Approval Letter

University Integrated Institutional Review Board
205 East 42nd Street
New York, NY 10017
http://www.cuny.edu/research/compliance.html

Approval Notice
Initial Application

04/20/2021

Thomas Bane,
Hunter College

RE: IRB File #2021-0114
Experiences of Climate Change in the United States Virgin Islands

Dear Thomas Bane,

Your Initial Application was reviewed and approved on 04/20/2021. You may begin this research.

Please note the following information about your approved research protocol:

Protocol Approval Period:	04/20/2021 - 04/20/2022
Protocol Risk Determination:	Minimal
Expedited Categor(ies):	(6) Collection of data from voice, video, digital, or image recordings made for research purposes.; (7) 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. (NOTE: Some research in this category may be exempt from the HHS regulations for the protection of human subjects. 45 CFR 46.101(b)(2) and (b)(3). This listing refers only to research that is not exempt.);

Documents / Materials:

Type	Description	Version #	Date
Curriculum Vitae	Thomas Bane Citi Document	1	01/05/2021
Interview Question(s)	Research guide.docx	1	02/08/2021
Interview Question(s)	Interview Guide for Key Informants.docx	1	02/08/2021
Telephone Screening Script	Screening_Script-2019_HC (1).doc	1	02/08/2021
Advertisement	Recruitment Flyer.doc	1	02/08/2021
Email Text	Recruitment Email.doc	1	02/08/2021

Appendix B: Screening Guide for Focus Groups

INSTRUCTIONS: Complete the text in pink. This template is designed for telephone screening *before* main study procedures. If you are using this script for other screening methods, revise the script to match the appropriate screening method (for example, revise reference to hanging up the phone). If you are merging main study consent form with screening consent, a statement to inform participants they will be asked to complete the identified screening procedures and what will be done with their screening data if eligible or ineligible should be included in the main study consent form.

THE CITY UNIVERSITY OF NEW YORK
Graduate Center
Social Welfare

ELIGIBILITY SCREENING SCRIPT

Title of Research Study: Experiences of Climate Change in the United States Virgin Islands

Principal Investigator: Thomas Bane
PhD Candidate

Thank you for your interest in our research. This research study will explore people's experiences of climate change in the United States Virgin Islands. I would like to ask you a few questions to determine whether you are eligible to participate in this research.

The screening will take about *five minutes*. I will ask you some questions about your age, where you live, and if you feel comfortable participating in a focus group in English. You do not have to answer any questions you do not wish to answer or are uncomfortable answering, and you may stop at any time. Your participation in the screening is voluntary.

We will make our best efforts to keep your answers confidential. No one except for the research team will have access to your answers. If you do not qualify for the study, your answers will be destroyed. If you do qualify for the research study and decide to participate and provide consent, your answers will be securely stored on a computer that is password protected.

Would you like to continue with the screening?

Instruction: If yes, continue with the screening. If no, thank the person and hang-up.

How old are you?
Where do you live?
Do you feel comfortable participating in a focus group in English?

Thank you for answering the screening questions.

Instruction:
Based upon your answers to these questions you are eligible to participate in the study.

Appendix C: Recruitment Email for Key Informants

Dear XX,

My name is Thomas Bane, a PhD Candidate from the Social Welfare Department at the City University of New York Graduate Center. I am currently recruiting participants for a research study about people's experiences of climate change in the United States Virgin Islands. This study may help us to better understand what impacts, if any, climate change has had on people.

You have been identified as a professional who can help me better understand people's experiences of climate change, and you are invited to participate in an interview on this topic.

The interview will take place on-line. The interview will be video and audio recorded for transcription and analysis. Your participation will last up to one hour for the interview.

As part of participating, you will be asked to share your professional insights into people's experiences of climate change and how it has impacted them.

If you participate, there is no anticipated direct benefit.

If you are interested in participating in this study, please respond to this email. Or contact Thomas Bane at tbane@[redacted]914-803-2928.

CUNY
University Integrated IRB
Protocol: 2021-0114
Approved: 04/20/2021
Expires: 04/20/2022

Appendix D: Discussion Guide for Focus Groups

Focus Group Guide

The focus group will take place for 90 minutes. It will take place virtually through an on-line platform.

The PI will introduce himself and thank the participants for their time.

At the onset of the virtual focus group, the participants will be reminded that the focus group will be video and audio recorded. Participants will not be required to answer any question that they do not want to. Additionally the participants can cease participation in the study at any time.

Basic online etiquette will be reviewed. Participants will be reminded to try to minimize background distractions and to be in a quiet and private space.

Participants will be reminded to refer to each other by the pseudonym they have selected and listed as their name on the virtual platform.

Participants will be asked open ended questions to ensure for discussion amongst members and to gather rich data. Participants will be asked about what they like about living in the USVI, what are the biggest challenges they face in the USVI, how they have seen changes to the USVI over time, what climate related events they have noticed and what, if any, their impact has been on them.

Appendix E: Key Informant Interview Guide

Interview Guide for Key Informants
Interviews will last for approximately 60 minutes and will be audio and video recorded for transcription and analysis. The interviews will be semi-structured to allow for maximal discussion.
PI will introduce himself and thank the informant for their time.

Informants will be informed that they do not have to answer any question that they do not want to. Additionally, informants can stop participating in the study at any time.

Key informants will be asked about their awareness of climate change impacts on communities in the USVI. They will be asked about people's general awareness of climate change is, what climate change events they have noticed over time, which types of events have been the most impactful on people, what types of social, cultural, and economic effects these events have had on individuals and communities, and what their perspectives are as professionals on climate change.

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