FROM THEORY TO PRACTICE: PARTICIPATORY APPROACHES TO UNDERSTANDING THE SOCIAL DIMENSIONS OF MANAGED RETREAT

By

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ABSTRACT

Sea level rise, coastal erosion, increased flooding, and more frequent storms pose a threat to the long-term habitability and, in some cases, the very existence of coastal places in the U.S. and around the world. Managed retreat, the strategic relocation of people, property, and infrastructure away from the coast, has gained much attention in recent years. As a long-term approach to climate change adaptation, it is a promising option for mitigating risk in the face of increasing coastal hazards. However, managed retreat efforts in the U.S. have largely focused on the technical, physical, and economic aspects of relocation. Recent studies indicate that these government-led, technocratic approaches have resulted in confusion, conflict, and inequitable outcomes. There is, therefore, a need to better understand the social dimensions of managed retreat, including how people are connected to place and why that matters for decision-making. This dissertation explores the social, cultural, political, and psychological aspects of managed retreat in the U.S., with a focus on coastal communities located in Southern Maine.

Chapter One uses a Critical Discourse Analysis (CDA) of policy documents to examine the procedural equity implications of how federal agencies in the U.S. frame public participation in managed retreat planning and decision-making processes. Results indicate that current approaches lack consistency across agencies and reinforce the use of methods that fall on the low end of the public participation spectrum, thereby increasing the risk of manipulation or co-optation. In particular, the findings point to the total omission within the discourse of the role that power plays in the context of participation. Chapter Two investigates the dynamics of place attachment with community members from two coastal neighborhoods in the town of Wells, Maine. This study uses Photovoice, a participatory research method, to understand what long-term residents care most about in coastal places that are meaningful to them as well as what concerns they have. The results identify factors that foster attachment to place as well as those that threaten attachment. Findings help to make visible the affective dimensions of place-based values and observations of change over time. Chapter Three explores the potential for using the Photovoice method as an applied approach to aid in the process of 'place detachment' in areas where managed retreat may be an option of last resort. Results show that the Photovoice process fosters the ability of participants to reflect on their lived experience with change, to consider value trade-offs, and to engage with loss. The findings suggest that, although they are committed

to staying in place for as long as possible, participants also recognize that “this place isn’t forever.”

This dissertation demonstrates 1) a need for formalized guidelines that foster more meaningful participation in order to ensure that outcomes of managed retreat are equitable; 2) the importance of incorporating affective dimensions of place attachment in coastal management policy and planning; and 3) the value of participatory approaches like Photovoice in helping communities process the loss of places they care about and are connected to. This research builds knowledge around both the theory and practice of managed retreat that can be applied in decision-making processes by policy makers, land use planners, engagement practitioners, and coastal communities.

This dissertation is dedicated to my mom and dad.
Here's to exceeding your wildest dreams.

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INTRODUCTION: FROM THEORY TO PRACTICE: PARTICIPATORY APPROACHES TO UNDERSTANDING THE SOCIAL DIMENSIONS OF MANAGED RETREAT

"It was heartbreaking, over the winter when there were storms, to watch the waves come over the dune…It's scary, because you're like, this place isn't forever…It's undeniable that there is change." Photovoice participant, Wells, Maine, 2021

Sea level rise, coastal erosion, and stronger or more frequent storms are increasing flooding in coastal communities and impacting lives and livelihoods, property and infrastructure, economies and ecosystems, and more (Oppenheimer et al. 2019; Marino 2018; Dupigny-Giroux et al. 2018; De Sherbinin et al. 2012). Responding to these impacts can take the form of attempting to keep water out (e.g., sea walls, levee systems), accommodating water (e.g., elevated buildings, raised roads), and getting out of water's way (e.g., retreat away from the coast) (Siders 2019a; Oppenheimer et al. 2019). In recent years, the concept of managed retreat has gained increasing attention as a strategic, long-term, transformative approach to climate change adaptation in coastal areas (Mach & Siders 2022; Hino et al. 2017; Koslov 2016; Bronen 2011). Managed retreat can be described as an approach to relocation that seeks to reduce hazards to coastal communities by strategically moving, demolishing, or abandoning waterfront homes, buildings, roads and other hard infrastructure in order to allow for inward movement of the shoreline (Hino et al. 2017).

Managed retreat in the US is not a new phenomenon. As a hazard mitigation policy, it dates back to the late 1970's, when it was used as a tool for reducing the risk of flooding disasters faced by communities living in river floodplains (Siders 2019b; Koslov 2016). The practice of managed retreat is expected to grow in the US and around the world as sea levels continue to rise (Siders & Ajibade 2021). Moving people and assets away from the coast is challenging on a number of fronts. It is a costly, complex, and often controversial strategy and, although it can reduce some risks, it can amplify others (Siders 2019b; Koslov 2016; Marino 2012). Managed retreat also raises questions about climate justice and equity (Farbotko et al. 2020; Jessee 2020; Siders 2019b; Marino 2018; Bronen 2011). To date, there is no standardized policy, plan, or process for guiding the managed retreat process in the US (Siders 2019b; Bronen

et al. 2018; Maldonado et al. 2013). Additionally, no formal guidance exists on how decisions about managed retreat are made or who should participate in decision-making (Bronnen 2015; Siders 2019b).

Considering who participates and who decides form the basis of theories about procedural justice and equity (IPCC 2018; Holland 2017; Scholsberg 2003; Young 1990). Meaningful and on-going participation in planning and decision-making processes by people who have lived experience with an environmental problem can result in outcomes that are more equitable and responsive to local needs and aspirations (Sprain 2016; Adger et al. 2013; Few et al. 2007; Arnstein 1969). Participation helps to achieve this, in part, by unearthing the types of social dimensions of climate change that are often overlooked by traditional assessment and planning processes, including those that are non-economic or intangible (McNamara et al. 2020; Tschakert et al. 2020; Bertana 2020). Understanding the social dimensions of managed retreat is critical for ensuring that the process of moving people and assets away from the coast does not result in an exacerbation of harm (Jessee 2020; Farbotko et al. 2020; Maldonado et al. 2020; Siders 2019b; Marino 2018). One social dimension in particular – place attachment – plays a central role in how people make decisions about whether, when, and how to retreat yet it remains underexplored in the context of managed retreat (McNamara et al. 2020; Devine-Wright & Quinn 2020; Marshall et al. 2012; Agyeman et al. 2009; Burley et al. 2007). Research is needed to better understand how place attachment interacts with managed retreat, including what the process of 'place detachment' might entail (Agyeman et al. 2009).

Considering both the complexity and urgency of identifying responses to sea level rise, in this dissertation I explore two social dimensions of managed retreat - decision-making and place attachment - with a focus on processes conducted in the US and an emphasis on coastal communities located in the Southern Maine. I bring together frameworks and methods for participation (e.g., procedural justice, public participation, and participatory action research) to understand the role of public participation in decision-making processes and how place attachment mediates lived experience with climate change, while identifying implications for managed retreat policy, planning, and practice. In the positionality statement, Table 1, and chapter descriptions below, I provide an overview of my dissertation and how my approach contributes knowledge to the theory and practice of managed retreat.

I am a climate change adaptation scholar-practitioner whose research is motived by a desire to better understand the social dimensions of managed retreat through the knowledge of people with lived experience and for the purpose of improving policy, planning, and practice. I locate myself at the intersection of critical theory, constructivism, and participatory research paradigms. Based on my own experience, I see these three paradigms as part of a dynamic continuum, or what Lincoln, Lynham, and Guba (2018) refer to as the fluidity of the categories and a "blurring of genres" (pg. 113). Thus, qualitative, participatory methodologies are well suited to my work. Qualitative approaches to research focus on "the study of natural social life" (Saldaña 2014). Qualitative methods are used to gain rich detail about and find meaning in human knowledge, perspectives, values, experiences, purpose, and processes (Miles et al. 2014; Patton 2014; Rubin & Rubin 2011; Krueger & Casey 2009; Cresswell 2003; Guba & Lincoln 1994). Participatory modes of inquiry address real-world problems with the communities who are experiencing them with the goal of affecting change at multiple scales (Greenwood & Levin 2006; Heron & Reason 2006; Reason & Bradbury 2008). The methodologies that I chose to use in this dissertation, Critical Discourse Analysis and Photovoice, reflect my metaphysical beliefs (e.g., ontology, epistemology, and methodology) and paradigm positionality.

Table 1: Dissertation Overview

Goal: To explore social dimensions of managed retreat, including the role of public participation in decision-making processes and how place attachment mediates lived experience with climate change, and to understand their implications for policy, planning, and practice					
	Research Objective	**Theoretical Background / Framework**	**Data Collection Method(s)**	**Sample / Study Area**	**Data Analysis**
Chapter 1	To evaluate the procedural equity implications of public participation discourse used in documents published by US federal agencies	Public Participation in Environmental Decision-Making Environmental Justice / Procedural Equity	Critical Discourse Analysis	10 guidance documents from four US federal agencies (FEMA, HUD, USACE, NOAA)	Qualitative analysis involving coding, data displays, memoing, summary statements

Table 1 (cont'd)

Chapter 2	To explore the dynamics of place attachment with community members from two coastal neighborhoods in a small town in southern Maine that is being impacted by sea level rise	Social Dimensions of Climate Change Adaptation Place Attachment	Photovoice: -Photographs w/narrative statements (n=133) -Facilitated focus group discussions (n=2)	12 property owners / residents from two coastal neighborhoods (Drakes Island and Moody Beach) in Wells, ME, USA	Qualitative analysis involving coding, data displays, memoing, summary statements
Chapter 3	To explore the potential to use Photovoice as an applied approach for understanding and facilitating the process of 'place detachment'	Participatory Action Research (PAR) The Science of Loss 'Place Detachment'	Photovoice: -Photographs w/narrative statements (n=133) -Semi-structured, in-depth interviews (n=12)	12 property owners / residents from two coastal neighborhoods (Drakes Island and Moody Beach) in Wells, ME, USA	Qualitative analysis involving coding, data displays, memoing, summary statements

In Chapter 1, *Managed Retreat: Who Decides? Promoting Public Participation for Environmentally Just Outcomes*, I investigated the procedural justice and equity implications of public participation discourse used in documents published by US federal agencies. Combining a procedural equity framework with a qualitative Critical Discourse Analysis (CDA), I analyzed 10 publicly available guidance documents, including handbooks, toolkits, guides, and planning frameworks, that provide internal guidance to these key federal agencies and to their external partners and grantees at the state, local, and Tribal levels. Results show that current approaches lack consistency across agencies and reinforce the use of methods that fall on the low end of the public participation spectrum, thereby increasing the risk of manipulation or co-optation. In particular, the findings point to the total omission within the discourse of the role that power plays in the context of participation and decision-making. This study contributes to the theory and practice of managed retreat by highlighting the need for formalized guidelines that foster

more meaningful participation, including community-led processes, in order to ensure equitable outcomes.

In Chapter 2, *"Living on the edge in a world where climate change is coming": Exploring place attachment through the lens of coastal communities in Southern Maine*, I explored the dynamics of place attachment with community members from two coastal neighborhoods in a small town in southern Maine that is being impacted by sea level rise. Using Photovoice, a Participatory Action Research (PAR) methodology, 12 participants and I explored their place-based values, local knowledge, observations of change, perceptions of risk, and concerns about the future of place. Factors that facilitate attachment to place as well as those that threaten it emerged through photographs, narrative statements, and focus group discussions. Findings help to make visible the affective dimensions of what makes place meaningful to people and experiencing environmental change over time, which have previously been difficult to account for in adaptation planning, policy, and practice.

In Chapter 3, *"This Place Isn't Forever": Photovoice as a tool for facilitating place detachment*, I expand on the research described in Chapter 2 to explore the potential of using the Photovoice methodology as an applied approach for facilitating the process of 'place detachment' in areas where managed retreat may be an option of last resort. The literature on the process of place detachment within a climate change context is sparse: little is known about what the process entails or how it can best be supported. Bringing together emerging theories about the science of loss with the methodological foundations of PAR, I conducted a qualitative analysis of 12 semi-structured, in-depth interviews alongside photographs and narrative statements to identify possible dynamics of the place detachment process. Results show that the Photovoice methodology fosters the ability of participants to reflect on their lived experience with change, to consider value trade-offs, and to engage with loss. The findings suggest that, although they are committed to staying in place for as long as possible, participants also recognize the impermanence of place. This research adds to the limited literature on place detachment by presenting Photovoice as an approach for supporting the social, cultural, and psychological needs of people as they let go of the places they are attached to.

In this dissertation, I present evidence that current government frameworks for public participation in adaptation decision-making fail to meet the standards of procedural equity. Additionally, I show that the affective dimensions of place attachment shape how people

experience and respond to climate impacts. Further, I argue that participatory approaches like Photovoice can be used to help communities process the loss of places that are meaningful to them. This dissertation builds knowledge around both the theory and practice of managed retreat that can be applied in decision-making processes by policy makers, land use planners, engagement practitioners, and coastal communities. Lastly, this dissertation gives voice to the lived experience of witnessing a cherished place change over time in ways that make the future of maintaining connection to place uncertain. The photographs and stories that the people I worked with shared for this research remind us that responding to climate change is not just a technical matter, it is also a deeply emotional experience. An engaged and empathetic approach to managed retreat policy, planning, and practice is critical.

REFERENCES

Adger, W. N., Barnett, J., Brown, K., Marshall, N., & O'Brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, *3*(2), 112-117.

Agyeman, J., Devine-Wright, P., & Prange, J. (2009). Close to the edge, down by the river? Joining up managed retreat and place attachment in a climate changed world. *Environment and Planning A*, *41*(3), 509-513.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners*, *35*(4), 216-224.

Bertana, A. (2020). The role of power in community participation: Relocation as climate change adaptation in Fiji. *Environment and Planning C: Politics and Space*, *38*(5), 902-919.

Bronen, R., Maldonado, J. K., Marino, E., & Hardison, P. (2018). Climate change and displacement: Challenges and needs to address an imminent reality. In *Challenging the Prevailing Paradigm of Displacement and Resettlement* (pp. 252-272). Routledge.

Bronen, R. (2015). Climate-induced community relocations: using integrated social-ecological assessments to foster adaptation and resilience. *Ecology and Society*, *20*(3).

Bronen, R. (2011). Climate-induced community relocations: creating an adaptive governance framework based in human rights doctrine. *NYU Rev. L. & Soc. Change*, 35, 357.

Burley, D., Jenkins, P., Laska, S., & Davis, T. (2007). Place attachment and environmental change in coastal Louisiana. *Organization & Environment*, *20*(3), 347-366.

Creswell, J. W. (2003). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 2nd Edition. Thousand Oaks: Sage Publications.

Devine-Wright, P., & Quinn, T. (2020). Dynamics of place attachment in a climate changed world. *Place attachment*, 226-242.

De Sherbinin, A., Levy, M., Adamo, S., MacManus, K., Yetman, G., Mara, V., Razafindrazay, L., Goodrich, B., Srebotnjak, T., Aichele, C., & Pistolesi, L. (2012). Migration and risk: net migration in marginal ecosystems and hazardous areas. *Environmental Research Letters*, 7(4), 045602.

Dupigny-Giroux, L., Mecray, E., Lemcke-Stampone, M., Hodgkins, G., Lentz, E., Mills, K., Lane, E., Miller, R., Hollinger, D., Solecki, W., Wellenius, G., Sheffield, P., MacDonald, A., & Caldwell, C. (2018). Northeast. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742.

Farbotko, C., Dun, O., Thornton, F., McNamara, K. E., & McMichael, C. (2020). Relocation planning must address voluntary immobility. *Nature Climate Change*, *10*(8), 702-704.

Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate policy*, *7*(1), 46-59.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2*(163-194), 105.

Greenwood, D. J., & Levin, M. (2006). *Introduction to action research: Social research for social change*. SAGE publications.

Heron, J., & Reason, P. (2006). The practice of co-operative inquiry: Research 'with' rather than 'on' people. *Handbook of action research: Concise paperback edition*, 144-154.

Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature Climate Change*, 7(5), 364.

IPCC. (2018). *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].

Jessee, N. (2020). Community resettlement in Louisiana: learning from histories of horror and hope. In *Louisiana's Response to Extreme Weather* (pp. 147-184). Springer, Cham.

Koslov, L. (2016). The case for retreat. *Public Culture*, 28(2 (79)), 359-387.

Krueger, R. & Casey, M. A. (2009). *Focus groups: A practical guide for applied research*. Sage Publications.

Lincoln, Y., Lynham, S., & Guba, E. (2018). Paradigmatic controversies, contradictions and emerging confluences, revisited. *The Sage handbook of qualitative research* (5th ed., pp. 108–150). Thousand Oaks, CA: Sage.

Mach, K. J., & Siders, A. R. (2021). Reframing strategic, managed retreat for transformative climate adaptation. *Science*, 372(6548), 1294-1299.

Maldonado, J., Wang, I. F. C., Eningowuk, F., Iaukea, L., Lascurain, A., Lazrus, H., Naquin, C. A., Naquin, J. R., Nogueras-Vidal, K. M., Peterson, K., Rivera-Collazo, I., Souza, M. K., Stege, M., & Thomas, B. (2021). Addressing the challenges of climate-driven community-led resettlement and site expansion: knowledge sharing, storytelling, healing, and collaborative coalition building. *Journal of environmental studies and sciences*, *11*(3), 294-304.

Maldonado, J., Marino, E. and Iaukea, L. (2020). Reframing the language of retreat. *Eos*, 101(10.1029).

Maldonado, J. K., Shearer, C., Bronen, R., Peterson, K., & Lazrus, H. (2013). The impact of climate change on tribal communities in the US: displacement, relocation, and human rights. In *Climate change and indigenous peoples in the United States* (pp. 93-106). Springer, Cham.

Marino, E. (2012). The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Global environmental change*, *22*(2), 374-381.

Marino, E. (2018). Adaptation privilege and Voluntary Buyouts: Perspectives on ethnocentrism in sea level rise relocation and retreat policies in the US. *Global environmental change*, 49, 10-13.

Marshall, N. A., Park, S. E., Adger, W. N., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters*, *7*(3), 034022.

McNamara, K. E., Bronen, R., Fernando, N., & Klepp, S. (2018). The complex decision-making of climate-induced relocation: Adaptation and loss and damage. *Climate Policy*, 18(1), 111-117.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). Qualitative data analysis: A methods sourcebook. 3rd edition.

Oppenheimer, M., B.C. Glavovic , J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, & Z. Sebesvari. (2019). Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].

Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.

Reason, P., & Bradbury, H. (2008). Introduction. *The SAGE Handbook of Action research: Participative inquiry and practice*, 1-10.

Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data*. Sage.

Saldaña, J. (2014). Coding and analysis strategies. *The Oxford handbook of qualitative research*, 581-605.

Schlosberg, D. (2003). The justice of environmental justice: reconciling equity, recognition, and participation in a political movement. *Moral and political reasoning in environmental practice 77*: 106.

Siders, A. R. (2019a). Managed retreat in the United States. *One Earth*, *1*(2), 216-225.

Siders, A. R. (2019b). Social justice implications of US managed retreat buyout programs. *Climatic change*, *152*(2), 239-257.

Siders, A. R., & Ajibade, I. (2021). Introduction: Managed retreat and environmental justice in a changing climate. *Journal of Environmental Studies and Sciences*, 11(3), 287-293.

Sprain, L. (2016). Paradoxes of public participation in climate change governance. *The Good Society*, *25*(1), 62-80.

Tschakert, P., Barnett, J., Ellis, N., Lawrence, C., Tuana, N., New, M., Elrick-Barr, C., Pandit, R., & Pannell, D. (2017). Climate change and loss, as if people mattered: values, places, and experiences. *Wiley Interdisciplinary Reviews: Climate Change*, 8(5), e476.

Young, I. M. (1990). *Justice and the Politics of Difference*. Princeton University Press.

CHAPTER 1: MANAGED RETREAT: WHO DECIDES? PROMOTING PUBLIC PARTICIPATION FOR ENVIRONMENTALLY JUST OUTCOMES

1.1 Introduction

The practice of managed retreat, a strategy for climate change adaptation in areas where permanent human habitation is expected to be untenable due to increasing risk from flooding, wildfires, and other climate impacts, is rapidly gaining traction among researchers, policy makers, planners, and even the media. Major news outlets like the New York Times have published special reports on managed retreat and climate migration (see for example Flavelle 2020 and Lustgarten 2020), while the U.S. Government Accountability Office (GAO) recently released a report recommending that Congress establish a federally-led pilot program to support communities who want to relocate in response to climate impacts (GAO 2020). Although it represents a promising option for strategic adaptation, managed retreat raises difficult questions about the social, economic, cultural, political, and legal aspects of responding to climate change impacts, such as land use policy, property rights, livelihoods, and emotional attachment to place (Burley et al. 2007; Agyeman 2009; Marino 2012; Koslov 2016; Hino et al. 2017; Siders et al. 2019). As well, there are many social justice and equity concerns associated with managed retreat (Marino 2018; Siders 2019).

In the U.S., the communities contending with the first and greatest risk of climate-induced relocation are also the communities who have historically faced and continue to deal with systemic oppression, poverty, and injustice (Maldonado et al. 2013). This includes several Indigenous communities, for whom removal and relocation away from their homelands is nothing new. Owing to these historical patterns of government-led relocation as well as ongoing discriminatory housing policies and hazard protection practices in the U.S., those who are most exposed and/or vulnerable to the damaging effects of natural hazards tend to be marginalized communities (e.g., Black, Indigenous, and People of Color, low income earners, etc.) (Siders 2019). Indeed, through previous processes of forced displacement and dislocation carried out by the U.S. government in the name of "progress," marginalized communities have consistently been relegated to marginalized lands that are increasingly at risk from sea level rise, coastal erosion, increased storm activity, and other effects of climate change (Marino 2012; Maldonado et al. 2020).

Understanding the social, cultural, and historical context in which managed retreat takes place is critical to ensuring that adaptation policies and planning processes do not reinforce inequity. Yet, managed retreat efforts to date have largely focused on the technical and physical aspects of relocating people and infrastructure away from climate-related hazards (Bertana 2019; Siders 2019). Recent studies indicate that these government-led, technocratic approaches to managed retreat, including property buyout programs in Staten Island following Hurricane Sandy and community-wide relocation efforts in Louisiana and Alaska, have resulted in confusion, conflict, and inequitable outcomes (Maldonado et al. 2013; Binder and Greer 2016; Marino 2018; Mach et al. 2019). Contributing to the complex challenges associated with managed retreat is the fact that, currently, there is no established governance framework or governmental agency, in the U.S. or elsewhere, dedicated to guiding the managed retreat process (Maldonado et al. 2013; Bronen et al. 2018; Siders 2019). There is also no commonly accepted protocol for determining who participates in decision-making about managed retreat (Bronnen 2015; Siders 2019).

Concerns about social justice and equity inevitably raise questions about who has access to and influence over decision-making processes – whose voice matters. Thus, the questions that researchers, practitioners, and policymakers ought to ask about managed retreat planning processes are not only whether, why, when, where, and how communities should relocate, but also and perhaps most importantly, *who decides*? As an emerging practice that is quickly garnering significant attention, there is a window of opportunity to create guidelines for pursuing managed retreat that facilitate open, transparent, and democratic decision-making processes. Without formal governance frameworks in place to support preventative and participatory planning processes for managed retreat, there is a risk of perpetuating the inequitable and unjust relocation practices that have taken place historically (Bronen et al. 2018). Through a critical discourse analysis of relevant policy documents, this study explores how public participation is framed by the federal agencies who currently support managed retreat efforts in the U.S., including whether guidance on participation in planning and decision-making processes is provided and to what extent that guidance fosters procedural equity.

1.2 Theoretical Background and Literature Review

The question of "who decides?" is central to the concept of procedural justice. One of the core dimensions of environmental justice, procedural justice is concerned with the processes and

procedures of decision-making, including who participates and whether / how their involvement shapes policy or planning outcomes (Young 1990; Holland 2017). Closely related, yet slightly more nuanced, is the concept of procedural equity, which is defined by the IPCC (2018) as, "equity in the process of decision-making, including recognition and inclusiveness in participation, equal representation, bargaining power, voice and equitable access to knowledge and resources to participate." In other words, justice *as process* seeks to expand and strengthen the role of public participation in decision-making (Schlosberg 2003), particularly among those who are frequently disenfranchised from such processes. In so doing, procedural justice is seen as a way to achieve a more equitable distribution of costs and benefits as well as ensure the political recognition of marginalized communities (Scholsberg 2003).

Fostering public participation is a well-established practice for improving the outcomes of environmental decision-making, and, in the U.S., it is commonly mandated by law (Senecah 2004; NRC 2008; Reed et al. 2009; Sprain 2016). While there is no single, standard definition, the National Research Council defines public participation as follows: "Organized processes adopted by elected officials, government agencies, or other public- or private-sector organizations to engage the public in environmental assessment, planning, decision making, management, monitoring, and evaluation" (NRC 2008 pp 1). The NRC (2008) also describes the "public" as consisting of the following: stakeholders who are part of organized interest groups; individuals who are selected by process organizers in order to serve as a representative sample of the general population and/or as representatives of certain perspectives, experiences, knowledges, interests, etc.; or people who voluntarily choose to participate in an open process. Participation of diverse public representatives in decision-making processes can help to build trust in, legitimization of, and support for policy development and implementation (Fischer 2003; Innes and Booher 2003). Additionally, participation contributes to formal inquiry into a problem, where the inclusion of different groups of people and their unique knowledge, values, and perspectives results in more robust understanding of an issue, including social dimensions that may otherwise be unknown or overlooked (Fischer 2003; Heron and Reason 2006; Renn and Schweizer 2009). Broadening participation to engage all relevant stakeholders in decision-making is also a core principle for building resilience in social-ecological systems (Biggs et al. 2015).

In the context on environmental management, federal agencies in the U.S. are often mandated by law to conduct public participation as part of their decision-making processes (Senecah 2004; Chung & Lounsbury 2006). For example, the National Environmental Policy Act, passed in 1969, requires federal agencies to assess the potential environmental impacts of any major project they propose to implement or provide a permit for (Rowe et al. 2017). Additionally, agencies across the federal government are mandated to conduct "regular and meaningful consultation and collaboration" with officials of federally recognized Native American Tribes on policy issues that have implications for their communities (Executive Order 13175). It is important to note that consultation here goes beyond the general conceptualization of public participation in that consultation takes place on a government-to-government basis given that federally recognized tribes have sovereign powers and the right to self-government (Executive Order 13175; Rowe et al. 2017).

Public participation plays an especially important role when addressing environmental problems in historically marginalized communities, where adverse effects may be felt disproportionally and are likely to exacerbate existing inequalities. Participation that engages people in a meaningful and empowering way is critical to gaining a holistic understanding of how environmental problems (as well as their potential solutions) affect marginalized communities who face distinct social and cultural impacts (Arquette et al. 2002; Adger et al., 2013). Public participation is particularly valuable in making decisions about climate change adaptation, as it helps in identifying the responses that best fit a community's needs, values, and aspirations (Few et al. 2007; Sprain 2016). It does so through surfacing and employing different types of knowledge and expertise, including local and Indigenous knowledge as well as lived experience, and uncovers the types of social, cultural, and historical dimensions underlying vulnerability, adaptive capacity, and resilience that top down, technocratic approaches are likely to miss (Hunold and Young 1998; Sprain 2016). In other words, ensuring justice and equity in the outcomes of climate change risk assessment and governance requires democratic approaches to decision-making (Hunold and Young 1998; Sprain 2006). Indeed, examples of participatory, community-led relocation efforts are tied to more just and equitable outcomes (Koslov 2016).

Public participation operates along a spectrum. Arnstein was one of the first to formally articulate this spectrum in her seminal 1969 paper detailing the ladder of citizen participation in decision-making. The ladder (Figure 1) features three levels and eight rungs, arranged as follows

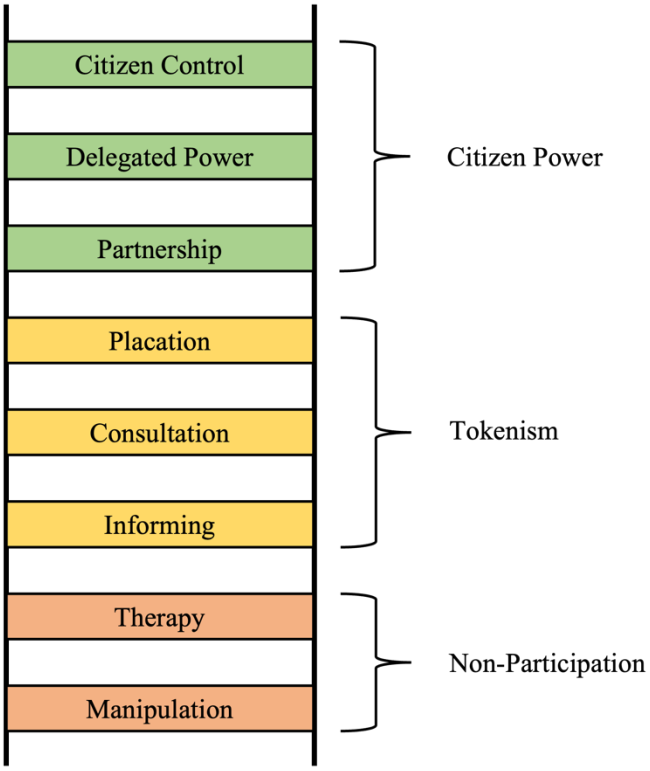

Figure 1: Arnstein's Ladder of Citizen Participation (Adapted from Arnstein 1969)

(from bottom to top): Non-Participation, composed of manipulation and therapy; Tokenism, featuring informing, consultation, and placation; and Citizen Power, comprised of partnership, delegated power, and citizen control (Arnstein 1969). Arnstein's argument rests on the idea that citizen participation is fundamentally about power, namely, recognizing who has a say in political and economic (and, by extension, social) processes. Her emphasis is on bringing in the voices and aspirations of those who have been marginalized and who bear more of the burdens associated with the outcomes of planning and decision-making processes. In other words, Arnstein views citizen participation as a way to redistribute benefits and ensure that marginalized communities have the ability to influence the trajectories of their own futures.

Others have expanded on Arnstein's conceptualization of citizen participation. For example, the International Association of Public Participation (IAP2) describes a spectrum of five levels (see Figure 2) arranged according to the impact the public has on a decision, starting with "Inform" on the low end, moving through "Consult", "Involve", and "Collaborate", and ending with "Empower" (IAP2 2018). The IAP2 model builds on Arnstein's ladder by defining the goals of participation as well as describing how the public can expect to be involved at

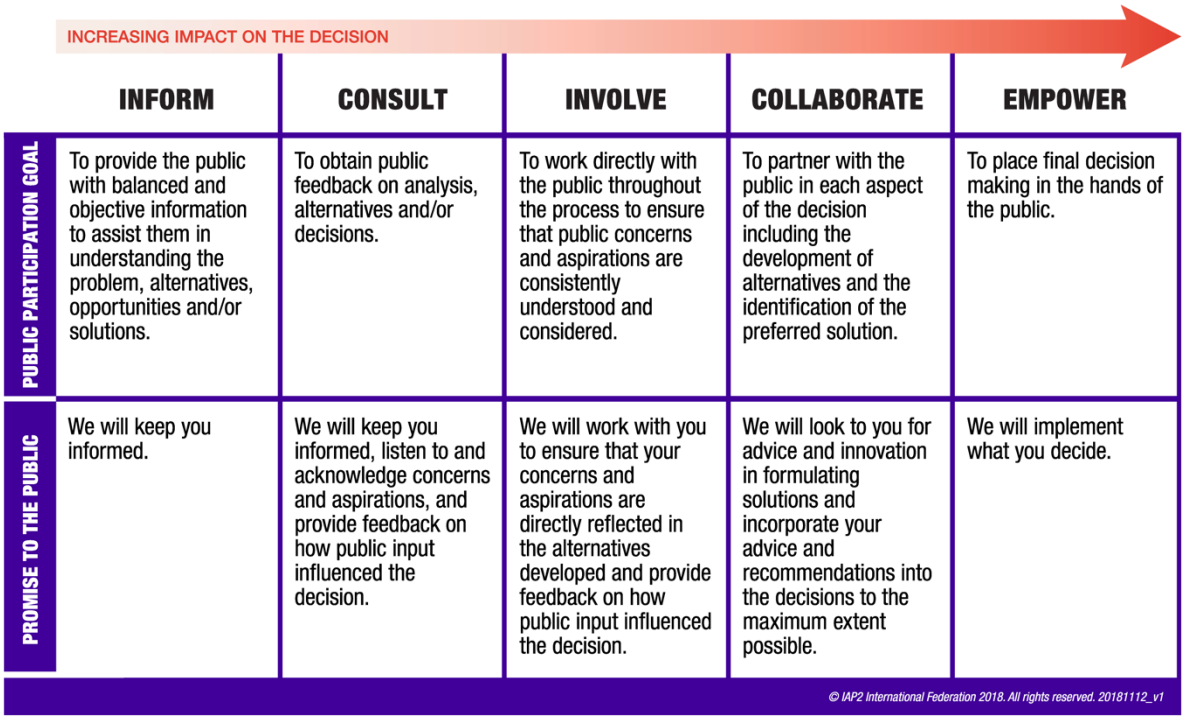

Figure 2: IAP2 Spectrum of Participation

different levels, providing further details on how influence and power operate across the spectrum. The National Research Council identified the following five dimensions of public participation as being influential in the design and outcome of participatory processes: 1) who is involved; 2) when they are involved; 3) the intensity of involvement (e.g., the amount of effort invested); 4) how much power and/or influence participants have; and 5) the goals of the process (NRC 2008). Here, the NRC adds to frameworks for public participation by highlighting the importance of determining who "the public" is and at what point or points in the process they will be engaged. Rowe and Fewer (2005) articulate three types of distinct approaches to public engagement that are defined according to the flow of information between officials and public participants: public communication, public consultation, and public participation. Public communication and public consultation both rely on one-way flows of information, with officials providing information to the public in the former and the public providing information to officials in the latter. Public participation, on the other hand, refers to engaging all relevant parties in a dialogic process (e.g., ongoing dialogue) that involves information exchange, knowledge co-generation, and perspective shifting (Rowe & Frewer 2005).

Of course, participation is not a panacea. On the contrary, participatory processes can be challenging on many fronts. Barriers such as accessible opportunities, time commitment

required, and the use of Excessively technical language can limit meaningful participation (Sprain 2016; Senecah 2004; Fischer 2003). Although it may begin to address issues related to the unequal distribution of power and control, participation by itself does not transform power dynamics between planners, policy makers, and communities (Cornwall 2008). Therefore, rather than seeing it purely as a technique for improving environmental policy and decision-making, participation should be regarded as an inherently political process that recognizes the context in which it takes place (Saltmarsh & Hartley 2011).

Equally important is the need to consider motivations for pursuing participation and how (or even, whether) it benefits community members (Arnstein 1969; McCloskey et al. 2013). When it is done poorly or for manipulative purposes, public participation can result in co-optation, coercion, even maladaptation (Few et al. 2007; Sprain 2016). Co-opted participation processes can further reinforce the exclusion of already marginalized voices, perspectives, and knowledges (Sprain 2016; Senecah 2004). The absence of meaningful participation can also lead to dissatisfaction with representation and the erosion of public trust in policy makers and political institutions (Melo and Baiocchi 2006). Indeed, without meaningful and transparent public engagement, the risk of misguided interventions or decisions by planners and policy makers rises, further exacerbating the potential of negative environmental impacts on already vulnerable or at-risk communities (Marino 2012). There is, therefore, a need to develop thoughtfully crafted approaches to public participation in decision-making around managed retreat.

Proactive and participatory planning for relocation as climate adaptation offers individuals and communities an alternative to reactive responses that occur as a result of sudden disaster and displacement, creating opportunity for people to exercise agency (Koslov 2016; Siders 2019). Even if the push for managed retreat comes as a response to a disaster, communities should have the ability to decide whether or when it is time to retreat and how the process unfolds (Bronnen et al. 2018; Farbotko et al. 2020). However, governments and institutions are ultimately responsible for supporting the process of managed retreat: communities can make the choice to get out of harms ways, but they cannot implement the process on their own (Koslov 2016). With the GAO report recommending a federally-led pilot program on climate relocation at the same time that there is no formal governance framework to support managed retreat, there is an urgent need to better understand how the government

agencies who will likely play a role in these efforts approach planning and decision-making processes, especially with regard to who has a say.

1.3 Methods

This study explores the procedural equity implications of guidance materials produced by US federal government agencies involved managed retreat-related planning and decision-making processes. According to the recent GAO report (2020), four federal agencies are currently the primary sources of support for retreat and relocation efforts: the Federal Emergency Management Administration (FEMA), Housing and Urban Development (HUD), the US Army Corps of Engineers (USACE), and the National Oceanographic and Atmospheric Administration (NOAA). To date, federal guidelines on how to plan for and implement managed retreat as a strategic response to climate change do not yet exist. Therefore, this study employed a critical discourse analysis to review and analyze publicly available government documents, including handbooks, toolkits, guides, and planning frameworks, that provide internal guidance to these key federal agencies and to their partners and grantees on 1) hazard mitigation, coastal community resilience, or climate adaptation planning, and/or 2) citizen participation and engagement. Although the documents analyzed are not specific to the practice of managed retreat, they provide insight into how the agencies view and frame participation in related areas of work.

Discourse shapes meaning and reality through the use of language in talk and text (Tonkiss 1998). Discourse also informs the ways that people conceptualize problems and solutions, including what is and what is not possible, thereby limiting or supporting options and alternatives associated with different visions of the future (Fischer 2003). Critical discourse analysis (CDA) views discourse as 'social practice' in that it both shapes and is shaped by the situations, institutions, and social structures that it operates within (Fairclough & Wodak 1997). CDA specifically investigates the relationships between language and power, including how discourse produces and reproduces inequitable power relations and systems of domination (Fairclough & Wodak 1997; van Dijk 2001). Notions of power are not just concerned with who has the ability to access and influence discourse, but also the ways in which discourse can be wielded as a tool (and, in some cases, even as a weapon) that reifies power (Fischer 2003). One way that power operates in discourse is by privileging certain discourses over others and special attention should be paid to interpreting which discourses are *not* present in the current narrative,

who those discourses likely belong to or what they represent, and why they may have been omitted (Tonkiss 1998; Fischer 2003). CDA can help to shed light on potential equity issues such as whose voices or perspectives are and are not included in problem definition and solution building efforts (Calliari 2018). Fairclough's (1989) three-dimensional framework for critical discourse analysis involves textual analysis (e.g., linguistic considerations), discursive analysis (e.g. how the text is produced and consumed, and by whom), and social analysis (e.g., the relationship between the discourse, power dynamics, and social change).

A total of 10 government documents (Table 2) were qualitatively analyzed to explore the discourse employed by these agencies regarding public participation in planning and decision-making processes. As a research method, discourse analysis is more concerned with the quality and richness of texts analyzed than with the quantity (Tonkiss 1998) and these 10 documents were determined to be the most complete, up-to-date, and publicly available examples of guidance materials produced by these agencies. Given the speed at which climate change policy and planning advances, documents reviewed were limited to those published within the last twelve years. Documents were selected using a purposive sampling approach (Etikan et al. 2016), where documents were chosen because of their characteristics (e.g., guidance document produced by one of the four federal agencies for partners and grantees) and relevance (e.g., planning and decision-making related to managed retreat-adjacent topics such as climate change adaptation, hazard mitigation, and/or community resilience). Documents were identified in the following ways: visiting official agency websites and entering into the search box function terms related to public participation, managed retreat, and/or the names of specific programs the GAO report (2020) identifies as relevant to the topic of moving people out of harms way (e.g.,FEMA's Hazard Mitigation Grant Program, HUD's Community Development Block Grant programs, NOAA's Coastal Zone Management Program, and USACE's Civil Works Program); navigating to online libraries or resource pages hosted by the agencies to find relevant documents; and/or searching for documents referenced while reviewing those already identified. Although other types of resources (e.g., virtual training modules) exist to provide guidance to agency partners and grantees, this analysis focused on text-based documents that were publicly available for download. Documents that were outdated (e.g., had been replaced by newer guidelines) were excluded from this analysis.

Table 2: Federal documents reviewed

Agency	Document Title	Year
FEMA	Hazard Mitigation Portfolio	2020
HUD	Community Resilience Toolkit	2020
FEMA	Tribal Mitigation Planning Handbook	2019
FEMA	National Mitigation Framework	2016a
USACE	Identifying and Engaging Socially Vulnerable Populations in the USACE Decision-Making Process	2016
FEMA	State Mitigation Planning Key Topics Bulletins: Planning Process	2016b
NOAA	Introduction to Stakeholder Participation	2015
HUD	Citizen Participation and Consultation Toolkit	2014
FEMA	Local Mitigation Planning Handbook	2013
NOAA	Adapting to Climate Change: A Planning Guide for State Coastal Managers	2010

Documents were analyzed qualitatively using a provisional coding scheme that blended deductive and inductive approaches (Miles et al. 2014), where a code book was developed starting with the language used in IAP2's spectrum of participation (inform, consult, involve, collaborate, empower, and participation). The IAP2 spectrum was selected for developing the codebook based on its use of simplified and commonly used language. The code book was expanded to include other terms used related to interactions with the public, communities, and/or stakeholders that emerged in the process of reviewing the discourse, including those that were used frequently across the agencies and throughout the documents as well as those that were used infrequently. See Table 3 for the full list of terms used in the coding process. Passages that included the coding terms were extracted and placed into data display tables that were organized by document and analyzed to identify patterns and themes (Miles et al. 2014). Memos and summary statements were used to interpret the data (Rubin & Rubin 2011; Miles et al. 2014). Commonly used validity procedures for qualitative research were used ensure the quality and rigor of this analysis, including the use of purposive sampling, creating an trail, including disconfirming evidence, and providing, thick, rich descriptions (Anfara et al. 2002; Cresswell & Cresswell 2018).

Table 3: Coding terms

Deductive Coding Terms
Inform (information)
Consult (consultation)
Involve (involvement)
Collaborate (collaboration, collaborative, collaboratively)
Empower (empowering, empowerment)

Table 3 (cont'd)

Inductive Coding Terms
Awareness
Communicate (communication)
Contribute
Cooperate (cooperation, cooperatively)
Educate (education, educational)
Engage (engagement)
Include (inclusion, inclusive)
Incorporate
Input
Participate (participation, participatory)
Partner (partnership)
Other (includes terms used infrequently across the documents, such as: Access, Capacity, Coalition, Comment, Consensus, Decision-Making, Dialogue, Equity, Equal, Expertise, Feedback, Input, Knowledge, Recognition, Representation, Review, Stakeholder, Values

1.4 Results

A "grammar of participation" emerged through the analysis, providing insight into how the discourse used is guidance documents produced by these four federal agencies interprets and frames public participation in planning and decision-making for their partners and grantees. The framing of the results, presented below, reflects the components of the definitions of procedural justice and equity described above.

1.4.1 Recognition, Representation, and Inclusiveness

Overall, the documents advocate for inclusiveness: a wide variety of people are identified for targeted outreach and engagement, described variously and often interchangeably as stakeholders, citizens, target audiences, populations, and communities. Some of the documents make a distinction between key stakeholders or sectors (e.g. business leaders, educational and cultural institutions, nonprofits, local, state, and federal officials, community planners, emergency managers, neighborhood groups) and the public more generally, with the former receiving more concrete or meaningful opportunities for involvement. Other documents argue that members of the general public fall into the stakeholder category, describing stakeholders as anyone with an interest in or the potential to be impacted by a decision. USACE (2016) makes an exception that people from Tribal communities should not be referred to as stakeholders and need to be engaged according to Tribal consultation guidelines. In several cases, people who are from socially vulnerable and/or marginalized communities are acknowledged with specific

recognition as being critical participants to engage in planning processes. These populations are described as older adults, children, people with disabilities, racial and ethnic minorities, those with limited English proficiency, and people with low-moderate income.

FEMA's National Mitigation Framework (2016) focuses heavily on engaging the "whole community," which is described as including individuals and communities, the public, private, faith-based, and non-profit sectors, and all levels of government as well as those from socially vulnerable populations. The concept of the whole community stems from the agency's National Preparedness Goal and is focused on "enabling the participation in national preparedness activities of a wider range of players…in order to foster better coordination and working relationships" (FEMA 2016a, pg. 1). NOAA's Introduction to Stakeholder Engagement (2015) is the only document to explicitly speak to representative participation, but rather than framing it as an argument for equity, it states that representation is important because, "Stakeholder groups that are omitted from a participant list can derail a process after much time and work have been invested" (pg. 8). No additional context is provided as to why those who are omitted might disrupt a process.

1.4.2 Equal Access to Knowledge and Resources

Only a few of the documents highlight the need to provide equal access to the knowledge and resources needed to foster effective participation in planning and decision-making. For example, FEMA (2016a) states, "Providing individuals and communities with equal access to information and resources will facilitate actions to adapt and withstand an emergency or disaster" (pg. 2) Resources are not clearly defined, but when descriptive information is provided, it primarily refers to informational or educational materials USACE (2016) does address the issue of resources within the context of marginalized communities: "Socially vulnerable groups may be marginalized from many resources including the decisions that are made in mainstream politics, economics, and government planning…Even if they are aware of the opportunity to participate, socially vulnerable people may have urgent daily concerns and limited time, making engagement difficult" (pg. 6). Here, access, attention, and time can be interpreted as resources. While most of the documents discuss the need to provide access and information to people with limited English proficiency, none of the documents address the issue of translating technical language for non-technical audiences to support better understanding and engagement. Interestingly, the term "empower" appears in only one document and is used in relation to

providing access to information and resources: "By empowering individuals and communities with knowledge and skills, we build a collective understanding of our roles and responsibilities in crisis" (FEMA 2016a, pg. 24).

Where participation takes place can impact access to knowledge and resources, especially if it is a space that hinders or facilitates meaningful involvement (Senecah 2004). NOAA (2015) recommends that engagement events should be held at centrally located and easily accessible sites so as to respect the time commitment of participants. Notably, while many of the documents point to the need to involve people with different access and functional needs, none of them provide specific guidance on ensuring that meeting spaces are physically accessible to people with disabilities. However, conceptualizing space more broadly, FEMA (2016b) argues that "virtual opportunities may help maximize participation by gathering as many stakeholders for collaboration while casting the net wide for participants who have limited availability," (pg. 7) which may also help extend access to some people with disabilities. Even with virtual opportunities, though, care must to take to ensure community members have the interest, capacity, and resources needed to engage this way.

1.4.3 Voice and Bargaining Power

The concept of "voice" in public participation processes can be vague. Senecah (2004) argues that voice equates to having access, standing, and influence. Put simply, this means that voice is not just having the opportunity to express one's perspectives (access). Rather, those perspectives must also be seen as legitimate (standing) and, further, they must be meaningfully considered in the decision-making process (influence). This concept is captured to a certain extent in the way that HUD's Citizen Participation and Consultation Toolkit (2014) frames participation, as "a pathway for all citizens to exercise their voice and influence decisions that affect their communities, neighborhoods, and way of life" (pg. 6). Although access is mentioned frequently, it is primarily in relation to accessing information and resources rather than the planning or decision-making processes themselves. When it is mentioned in reference to these processes, the types of access suggested are limited to public review of or comment on draft plans. Beyond references to legally required opportunities for the public to participate, references to aspects of legitimacy or standing are absent from the documents.

Influence and bargaining power are closely related and are, in part, tied to the intended purpose of seeking or facilitating participation – in other words, the *why* that motivates

participation. NOAA (2015) emphasizes the need for agencies and their grantees to clearly articulate expectations and boundaries about the purpose and structure of participation, including, "How stakeholder input will be used, and the degree to which stakeholder input will influence final decisions" (pg. 8). When motivations for participation are articulated in the documents, they focus almost exclusively on the pragmatic benefits of involving stakeholders and the public. These benefits are described as opportunities for increasing access to local data and information, improving policy and project outcomes, fostering community buy-in and support, reducing or resolving conflict, and increasing compliance. Several documents highlight participation as a means for gaining more complete knowledge and information about the nature of problems so that better plans for addressing them can be developed. FEMA's Local Mitigation Planning Handbook (2013) explains, that, "Although members of the public may not be technical experts, they can help identify community assets and problem areas, describe issues of concern, narrate threat and hazard history, prioritize proposed mitigation alternatives, and provide ideas for continuing public involvement after plan adoption" (pg. 3-3).

Whether and to what extent the public can exert their voice and bargaining power in planning and decision-making processes is also mediated by *how* they participate. The documents reviewed promote the model of participation as a spectrum, highlighting methods that range from low level, passive outreach (e.g., newsletters, social media campaigns, public comment periods) to more engaged, active involvement (e.g., focus groups, public meetings, planning charrettes). Clearly, methods that fall on the low end of the participation spectrum afford little to no opportunity for exercising influence or bargaining power. Even though some examples of more participatory methods are provided, prevalent across the documents is a framing of participation as a primarily one-way flow of information (either from officials to the public or vice versa) used to garner buy-in and support among the public. For example, as explained in FEMA's State Mitigation Planning Process bulletin (2016), "Public engagement is an opportunity to educate people who live and work in the state on hazard mitigation and to provide them the opportunity to comment on the plan" (pg. 6). As well, while the HUD Citizen Participation and Consultation Toolkit (2014) speaks expansively about the value of well-designed participatory processes, it also emphasizes the need to conduct the types of low-engagement approaches that are most commonly required by the federal government: public notice, public comment periods, and public meetings. That there is no "one size fits all" approach

is emphasized on multiple occasions, along with the recommendation that engagement methods should be chosen based on the nature of the problem and the dynamics of the community.

Similarly, *when* participation takes place – including both timing and duration – impacts the ability of affected populations to exercise voice and bargaining power. Rather than being seen as a one-off event, there is a broad understanding and agreement throughout the documents that participation is a process that should take place across the lifespan of any process or project. Several of the documents emphasize the importance of incorporating stakeholder and/or public participation from the outset of planning and decision-making, which is framed as a way to ensure that all relevant information related to risk is obtained and that priorities are aligned among the various parties involved. FEMA (2016) frames on-going engagement as a way to foster collaboration: "Maintaining a continual dialogue in a trusted environment is essential for connecting public and private sector interests, as well as individual and shared values, interests, and priorities across multiple communities" (pg. 23). However, none of the documents speak to considerations regarding the timing of opportunities to participate, for example, the time of day, week, or year, that could limit or expand who is able to participate.

1.5 Discussion

While there are guidelines and frameworks in place that advocate for and provide guidance on public participation in planning and decision-making, the findings of this analysis suggests that the discourse on participation employed by federal agencies falls on the lower end of the participation spectrum (e.g., inform, consult, involve) and fails to fully meet the standards of procedural justice. Further, if we look back to Fairclough's 3-dimensional model, we find the following: at the Textual Level, the documents addressed some dimensions of procedural equity but overall they promoted low level approaches to participation. At the Discursive Level, these documents are produced by powerful federal agencies for the purposes of providing guidance both internally within the agencies and externally to state, local, Tribal, and community-based partners and grantees. Thus, at the Social Level, the lack of attention to power and the failure to meet the standards of procedural justice is reproduced at cascading levels through the discourse employed by key federal agencies in these representative documents.

The discourse is strongest in regard to how it positions recognition, representation, and inclusiveness, the first dimension of procedural equity. "Who participates?" is a fundamental question in the design of participatory decision-making processes and is especially important in

cases where the representation of marginalized voices is necessary to address social justice and equity concerns (Malloy & Ashcraft 2020). The majority of the documents reviewed addressed the broad range of people who are important to reach and include in planning processes, including those who are commonly considered as key stakeholders as well as those from historically excluded groups, and many of them also highlighted ways of broadening outreach and engagement to hard-to-reach populations. Even if outreach to a diversity of people and communities occurs, an open invitation to participate is rarely, if ever, enough to ensure that participation occurs at all, much less in any kind of significant way (Arnstein 1969; Senecah 2004). Effective and meaningful participation requires certain knowledge, resources, and capacities, including access to timely, accurate, and relevant information as well as technical support (Senecah 2004; Fischer 2003). Several documents highlight the need to provide equal access to knowledge and resources, the second dimension of procedural equity. However, descriptions about what kind of knowledge (including whose knowledge) and resources are sparse; where provided, they are mostly limited to informational or educational materials, which are not likely to be the kinds of resources that would make decision-making more just or equitable. Relatedly, another barrier preventing meaningful participation is the use of excessively technical language (Fischer 2003). None of the documents reviewed provided guidance about the need to ensure that the language used in materials or during events was accessible to non-technical audiences. People may also be disenfranchised because they don't have the time or energy to participate, or they may fear the social ramifications of participation, including impacts on livelihoods, emotional wellbeing, and community cohesion (Farquhar & Wing 2008). While some of the documents address the need to tailor participation methods or strategies to meet the needs of participants with limited resources and capacities, none of the documents identify fear of negative impacts associated with participation as a potential barrier for certain populations.

Negative emotions associated with the act of participation, whether it be fear, mistrust, or disillusionment, is fundamentally about power and influence – namely, who has it and who doesn't. Identifying discourse in the documents related to the third dimension of procedural equity - voice and bargaining power - proved more challenging, in part because these two concepts are more nuanced and multi-dimensional. Many of the documents advance the idea that participation is valuable because it can result in more complete information about a problem and the development of plans that are more reflective of or responsive to people's needs, as well as

foster greater buy-in and support for proposed solutions. While all of these motivations are well reflected within the literature on public participation, when comparing these outcomes to Arnstein's ladder or IAP2's spectrum, they align best with the placation or involve categories. Ultimately, these types of motivations limit the ability of participation to foster justice and equity because they do little to nothing to redistribute power. In fact, the most glaring omission in the discourse employed in these documents is any reference to the role that power plays in the context of participation.

Although there are a couple of examples in the documents of the need to "empower" people, not one of the documents addresses or even raises power as an important dynamic to consider or address when conducting public participation. Power operates as a barrier to participation in a multitude of ways. Participation events and processes are not neutral or objective; rather, they are socially constructed, and although they can provide opportunities for inclusion and empowerment, they are also subject to exclusion and power struggles (Sprain 2016). If (or, perhaps more likely, when) there are inequities and/or power imbalances present in a group, it can undermine the ability to achieve just outcomes (Hunold & Young 1998). If issues related to power are left unaddressed, the risk of co-optation heightens (Sprain 2016). Participation processes that aspire to be more just and equitable need to be built in ways that addresses equity and power issues head on, either by insulating them to every extent possible or compensating for it by providing additional resources and support to participants who may be disadvantaged or marginalized (Hunold & Young 1998).

Co-optation can also occur if there is a lack of consensus or shared understanding of what "participation" means in a decision-making context (Sprain 2016; Chung and Lounsbury 2006). Being open and honest about the parameters of participation, such as how participant's input will be used and whether that input will impact decision-making, is a rather simple first step to engaging with the public and yet only two of the documents reviewed touched on the need for transparency. Transparency is critical in the ability of the public to exert influence over planning or decision-making processes: different perceptions regarding the scope of participation, including the extent to which participants have influence, bargaining power, or even control over the process and outcomes, can lead to significant conflict and backlash (NRC 2008; Arnstein 1969). Chung and Lounsbury (2006), as well as Martin (2008), argue that defining participation from the outset of a project is critical. Presuming that all parties share an understanding or

expectations of what participation means without explicitly expressing those perspectives is likely to result in power struggles that delay or undermine the outcomes of public participation, so guidance documents should stress the need to address this directly and early on.

Certain knowledge, skills, and capacities are also needed on behalf of the officials who convene and facilitate participation events and processes, especially if these efforts are going to make any headway in fostering equity and redistributing power. In many cases, government officials are not knowledgeable about or experienced in planning and facilitating meaningful forms of public participation beyond more traditional, low engagement approaches like public comment periods or public hearings (Senecah 2004). Of the documents reviewed, only one (NOAA 2010) highlights the potential benefit of partnering with experts in communication and participatory planning in order to improve participation impacts and outcomes. None of the documents suggest that the planners, policy makers, or agency officials who implement agency-supported projects might need to consider their own knowledge and skills (or, lack thereof) when it comes to conducting public participation. Participation done poorly, without knowledge of or regard to best practices, also runs the very real risk of being manipulative or co-opted.

Being able to effectively facilitate participation events or processes in a meaningful and equitable way requires a participatory worldview. This means that all people – planners, policy makers, technical experts, members of the public, etc. - enter into a process as equal participants who are committed to accepting many ways of knowing, to the co-generation of knowledge with others, and to the transformation of the status quo as it relates to who has the power to make decisions and the processes through which problems are typically solved (Reason & Bradbury 2001). A participatory worldview also represents a sense of responsibility for engaging with issues of public concern in a judicious and inclusive way (Reason & Bradbury 2001). Additionally part of the process of working with the public generally and with people from historically excluded groups especially is building relationships and establishing trust (Few et al. 2011; McCloskey et al., 2013), which requires sustained effort over time and should be considered a key part of the process. One of the documents (FEMA 2020) does acknowledge the level of effort required for robust participation but it repeatedly identifies having to do so as a challenge for grantees. As well, the tone of most of the documents suggests an understanding of participation and engagement as unidirectional, where information goes from the agency official

to the public or vice versa. These relationships should be seen as two-way streets, where both parties are committed to mutual respect, learning, and reciprocity (Glass & Fitzgerald 2010).

Another aspect of a participatory worldview concerns the dynamics of knowledge and expertise, which can be wielded as a tool of power. A few of the documents discuss the importance of incorporating local knowledge but only one of them refers to expertise that exists at the community level. Planners and policy makers may view local and Indigenous knowledges as valuable in that they contribute to a more holistic understanding of environmental problems (Whyte 2016); yet they may ultimately regard this knowledge as anecdotal and thus less valid because it does not fit their mental models of empirical data or subject expertise (O'Rourke et al, 2017). This hierarchical standpoint on the validity of other knowledge systems and ways of knowing is likely to have a negative impact on the ability of planners and policy makers to effectively and equitably engage with members of the public from impacted communities (Saltmarsh & Hartley 2011). People and communities who have place-based knowledge and lived experience with, for example, the impacts of sea level rise in that place are local experts and need to be treated as such in public participation events and processes. Discourse in guidance documents produced by or for government agencies should reflect this.

Regardless of the capacities or worldviews that agency officials have, though, Chung and Lounsbury (2006) wonder whether or not a truly participatory process is possible when it is conducted at the behest of a government body and within a bureaucratic framework because of inherent power imbalances. They argue that this is especially true in cases where participation is mandated, because participation may be co-opted, manipulative, or even coerced in the interest of an agency or other government body being able to tick a box indicating they've done their due diligence to engage with the public, which clearly defeats the intended emancipatory purpose of participatory processes. This concern is very relevant and real in the context of managed retreat, where examples of communities being manipulated or even shut out of decision-making process about climate-forced displacement and relocation already exist (Marino 2012; Jessee 2020; Maldonado et al. 2021). This suggests that institutional frameworks and governance processes are needed that facilitate preventative and legitimately participatory decision-making as it relates to climate-induced retreat and relocation (Siders 2019; Bronen et al. 2018).

These processes should be community-based and community-led, with high levels of on-going, meaningful public participation and shared decision-making powers (GAO 2020; Bronen

et al. 2018). Bronen et al. (2018) argue that a pro-active and participatory framework for climate-induced relocation would clarify which agencies are responsible for supporting communities as well as when and how they should work together; identify thresholds for relocation so that preventative action can be taken; and be flexible so as to allow for community decision-making about whether or when it is time to retreat and what retreat looks like (e.g., accommodating community-wide movement if that is preferred). Under the right circumstances, managed retreat could be seen as an opportunity for transformation and positive community outcomes. Without improved relocation policies and practices that can "better manage, plan for, and organize resettlements in a culturally appropriate and effective manner, with the full participation and guidance of the affected population," though, the same unjust and inequitable outcomes associated with forced relocations of the past are likely to persist (Bronen et al. 2018, pg. 259).

1.6 Limitations

There are several limitations to this study. Since mid-2020, when this research was initially conducted, a new U.S. presidential administration took office. This administration has voiced support for and started providing financial resources to communities who wish to pursue retreat and relocation. They have also elevated environmental justice as a priority. Federal agencies have created new and updated guidance documents that reflect these changes. However, it is worth noting that the lack of a consistent, federal approach to supporting retreat and relocation remains. Still, further analysis of the updated documents to assess whether and/or how the discourse has changed over time is warranted. As well, CDA is ultimately a subjective method and the sample used in this study was limited to a small number of text-based documents. Although the results are likely not generalizable, they serve as a useful starting point for considering the procedural equity implications of the discourse employed by federal agencies. Further research is needed to triangulate these findings, for example, through discourse analysis of multi-media training materials and qualitative research methods (e.g., interviews, surveys, participant observation) conducted with those who have experience with government-supported environmental planning and decision-making processes, including impacted communities.

1.7 Conclusion

Through a critical examination of documents produced by the four US federal government agencies who are most likely to play leading roles in managed retreat efforts, this analysis found that while the discourse around public participation addressed some dimensions of equity it

failed to fully meet the standards of procedural justice. Results indicate that current approaches lack consistency across agencies and reinforce the use of methods that fall on the low end of the public participation spectrum, thereby increasing the risk of manipulation or co-optation. In particular, the findings point to the total omission within the discourse of the role that power plays in the context of participation and decision-making. This study demonstrates a need for formalized guidelines that facilitate more meaningful and on-going participation in managed retreat decision-making in order to ensure that outcomes are equitable. As federal efforts to support retreat and relocation expand, agencies will need to provide consistent guidance on how to implement these projects. The results of this study can help to inform the development of these guidelines, especially with regard to understanding and addressing the role that power plays in the context of participation.

The social justice and equity stakes related to managed retreat are too high to maintain engagement practices that fall on the low end of the public participation spectrum, where access may be provided but standing and influence are absent. As more and more communities are faced with long-term or permanent displacement due to the impacts of climate change, it is imperative to develop thoughtfully crafted approaches to public participation in planning and decision-making around managed retreat. These approaches should foster deep engagement, knowledge exchange, and empowerment among the wide variety of actors who have a stake in relocation, including homeowners, business owners, and other members of the public in affected communities as well as policymakers, resource managers, regional and local planners. There is an opportunity here for scholars and practitioners of participatory processes, as well as community members themselves, to provide guidance on developing best practices for supporting community-led managed retreat processes. Government agencies who are or may be involved in managed retreat efforts should partner with and learn from those who have experience and expertise in working equitably with communities to ensure that the discourse in guidance documents does not produce (or, reproduce) systems of harm and dominance.

REFERENCES

Adger, W. N., Barnett, J., Brown, K., Marshall, N., & O'brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature climate change*, *3*(2), 112-117.

Agyeman, J., Devine-Wright, P., & Prange, J. (2009). Close to the edge, down by the river? Joining up managed retreat and place attachment in a climate changed world. *Environment and Planning A*, *41*(3), 509-513.

Anfara Jr, V. A., Brown, K. M., & Mangione, T. L. (2002). Qualitative analysis on stage: Making the research process more public. *Educational researcher*, *31*(7), 28-38.

Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners*, *35*(4), 216-224.

Arquette, M., Cole, M., Cook, K., LaFrance, B., Peters, M., Ransom, J., Sargent, E., Smoke, V. & Stairs, A. (2002). Holistic risk-based environmental decision making: a Native perspective. *Environmental health perspectives*, *110*(suppl 2), 259-264.

Bertana, A. (2019). Relocation as an Adaptation to Sea-Level Rise: Valuable Lessons from the Narikoso Village Relocation Project in Fiji. *Case Studies in the Environment*.

Biggs, R., Schlüter, M., & Schoon, M. L. (Eds.). (2015). *Principles for building resilience: sustaining ecosystem services in social-ecological systems*.

Binder, S. B., & Greer, A. (2016). The devil is in the details: Linking home buyout policy, practice, and experience after Hurricane Sandy. *Politics and Governance*, *4*(4), 97-106.

Bronen, R. (2015). Climate-induced community relocations: using integrated social-ecological assessments to foster adaptation and resilience. *Ecology and Society*, *20*(3).

Bronen, R., Maldonado, J. K., Marino, E., & Hardison, P. (2018). Climate change and displacement: Challenges and needs to address an imminent reality. In *Challenging the Prevailing Paradigm of Displacement and Resettlement* (pp. 252-272). Routledge.

Burley, D., Jenkins, P., Laska, S., & Davis, T. (2007). Place attachment and environmental change in coastal Louisiana. *Organization & Environment*, *20*(3), 347-366.

Chung, K., & Lounsbury, D. W. (2006). The role of power, process, and relationships in participatory research for statewide HIV/AIDS programming. *Social Science & Medicine*, *63*(8), 2129-2140.

Cornwall, A. (2008). Unpacking 'Participation': models, meanings and practices. *Community development journal*, *43*(3), 269-283.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Fairclough, N. (1989). *Language and power*. Routledge.

Fairclough, N. & Wodak, R. (1997). Critical Discourse Analysis. In *Discourse as Social Interaction*. T. van Dijk (ed.). London: Sage.

Farbotko, C., Dun, O., Thornton, F., McNamara, K. E., & McMichael, C. (2020). Relocation planning must address voluntary immobility. *Nature Climate Change*, *10*(8), 702-704.

Farquhar, S. A., & Wing, S. (2003). Methodological and ethical considerations in community-driven environmental justice research: two case studies from rural North Carolina. In *Community-based participatory research for health.* Minkler, M., & Wallerstein, N. (Eds.). John Wiley & Sons

FEMA. (2013). Local Mitigation Planning Handbook. https://www.fema.gov/media-library-data/1590070172371-48e87ca446838ba81afc2aca995940bc/FEMA_Local_Mitigation_Planning_Handbook_508.pdf. Accessed 21 September 2020.

FEMA. (2016a). National Mitigation Framework. https://www.fema.gov/sites/default/files/2020-04/National_Mitigation_Framework2nd_june2016.pdf. Accessed 21 September 2020.

FEMA. (2016b). State Mitigation Planning Key Topics Bulletins: Planning Process. https://www.fema.gov/media-library-data/1468867403587-36535211c7c892fb7b1956e961d05a49/PlanningProcess_KeyTopics_Bulletin_508.pdf. Accessed 21 September 2020.

FEMA. (2019). Tribal Mitigation Planning Handbook. https://www.fema.gov/media-library-data/1557427010130-933339dcaac712d76c599e3cb7d255ea/Tribal_Planning_Handbook_Final_508.pdf. Accessed 21 September 2020.

FEMA. (2020). Hazard Mitigation Portfolio. https://www.fema.gov/sites/default/files/2020-08/fema_mitigation-action-portfolio-support-document_08-01-2020_0.pdf. Accessed 21 September 2020.

Few, R., Brown, K., & Tompkins, E. L. (2007). Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate policy*, *7*(1), 46-59.

Fischer, F. (2003). *Reframing public policy: Discursive politics and deliberative practices*. Oxford University Press.

Flavelle, C. (2020). U.S. Flood Strategy Shifts to 'Unavoidable' Relocation of Entire Neighborhoods. *The New York Times*. https://www.nytimes.com/2020/08/26/climate/flooding-relocation-managed-retreat.html. Accessed 21 September 2020.

Glass, C. R., & Fitzgerald, H. E. (2010). Engaged scholarship: Historical roots, contemporary challenges. *Handbook of engaged scholarship: Contemporary landscapes, future directions*, 1, 9-24.

GAO. (2020). A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure. https://www.gao.gov/products/GAO-20-488. Accessed 21 September 2020

Heron, J., & Reason, P. (2006). The practice of co-operative inquiry: Research 'with'rather than 'on' people. *Handbook of action research: Concise paperback edition*, 144-154.

Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature climate change*, *7*(5), 364-370.

Holland, B. (2017). Procedural justice in local climate adaptation: political capabilities and transformational change. *Environmental Politics*, *26*(3), 391-412.

HUD. (2014). Citizen Participation and Consultation Toolkit. https://www.hudexchange.info/sites/onecpd/assets/File/eCon-Planning-Suite-Citizen-Participation-Toolkit.pdf. Accessed 21 September 2020.

HUD. (2020). Community Resilience Toolkit. https://files.hudexchange.info/resources/documents/HUD-Community-Resilient-Toolkit.pdf. Accessed 21 September 2020.

Hunold, C., & Young, I. M. (1998). Justice, democracy, and hazardous siting. *Political studies*, *46*(1), 82-95.

Innes, J. E., & Booher, D. E. (2003). Collaborative policymaking: governance through dialogue. *Deliberative policy analysis: Understanding governance in the network society*, 33-59.

IAP2. (2018). IAP2 Spectrum of public participation. https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf. Accessed 21 September 2020.

IPCC. (2018). Annex I: Glossary [Matthews J B R (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.

Jessee, N. (2020). Community resettlement in Louisiana: learning from histories of horror and hope. *Louisiana's Response to Extreme Weather: A Coastal State's Adaptation Challenges and Successes*, 147-184.

Koslov, L. (2016). The case for retreat. *Public culture*, *28*(2), 359-387.

Lustgarten, A. (2020). How climate migration will reshape America. New York Times. https://www.nytimes.com/interactive/2020/09/15/magazine/climate-crisis-migration-america.html?action=click&module=Spotlight&pgtype=Homepage. Accessed 21 September 2020.

Mach, K. J., Kraan, C. M., Hino, M., Siders, A. R., Johnston, E. M., & Field, C. B. (2019). Managed retreat through voluntary buyouts of flood-prone properties. *Science Advances*, *5*(10), eaax8995.

Maldonado, J. K., Shearer, C., Bronen, R., Peterson, K., & Lazrus, H. (2014). The impact of climate change on tribal communities in the US: displacement, relocation, and human rights. *Climate Change and Indigenous Peoples in the United States: Impacts, Experiences and Actions*, 93-106.

Maldonado, J., Marino, E. & Iaukea, L. (2020). Reframing the language of retreat. *Eos*, 101(10.1029).

Maldonado, J., Wang, I. F. C., Eningowuk, F., Iaukea, L., Lascurain, A., Lazrus, H., Naquin, C. A., Naquin, J. R., Nogueras-Vidal, K. M., Peterson, K., Rivera-Collazo, I., Souza, M. K., Stege, M., & Thomas, B. (2021). Addressing the challenges of climate-driven community-led resettlement and site expansion: knowledge sharing, storytelling, healing, and collaborative coalition building. *Journal of environmental studies and sciences*, *11*(3), 294-304.

Malloy, J. T., & Ashcraft, C. M. (2020). A framework for implementing socially just climate adaptation. *Climatic Change*, *160*(1), 1-14.

Marino, E. (2012). The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Global environmental change*, *22*(2), 374-381.

Marino E (2018) Adaptation privilege and Voluntary Buyouts: Perspectives on ethnocentrism in sea level rise relocation and retreat Marino, E. (2018). Adaptation privilege and voluntary buyouts: Perspectives on ethnocentrism in sea level rise relocation and retreat policies in the US. *Global Environmental Change*, *49*, 10-13.

Martin, A. W. (2008). Action research on a large scale: Issues and practices. *SAGE handbook of action research: Participative inquiry and practice*, 394-406.

McCloskey, D. J, McDonald, M. A., Cook, J., Heurtin-Roberts, J., Updegrove, S., Sampson, D., Gutter, S., and Eder, M. (2011). Community engagement: definitions and organizing concepts from the literature. In *Principles of Community Engagement*. National Institutes of Health.

Melo, M. A., & Baiocchi, G. (2006). Deliberative democracy and local governance: towards a new agenda. *International Journal of Urban and Regional Research*, *30*(3), 587-600.

NOAA. (2010). Adapting to Climate Change: A Planning Guide for State Coastal Managers. https://coast.noaa.gov/data/czm/media/adaptationguide.pdf. Accessed 21 September 2020.

NOAA. (2015). Introduction to Stakeholder Participation. https://coast.noaa.gov/data/digitalcoast/pdf/stakeholder-participation.pdf. Accessed 21 September 2020.

National Research Council (NRC). (2008). *Public participation in environmental assessment and decision-making*. National Academies Press.

O'Rourke, M., Hall, T. E., Boll, J., Cosens, B., Dietz, T., Engebretson, J., Goralnik, L., Piso, Z., Valles, S., & Whyte, K. (2017). Values and Responsibility in Interdisciplinary Environmental Science: A Dialogue-Based Framework for Ethics Education. NSF-sponsored Ethics Education in Science & Engineering curriculum located online at http://eese.msu.edu/. Accessed 21 September 2020.

Reason, P., & Bradbury, H. (2001). Inquiry and participation in search of a world worthy of human aspiration. *Handbook of action research: Participative inquiry and practice*, 1-14.

Reed, M. S. (2008). Stakeholder participation for environmental management: a literature review. *Biological conservation*, *141*(10), 2417-2431.

Renn, O., & Schweizer, P. J. (2009). Inclusive risk governance: concepts and application to environmental policy making. *Environmental policy and governance*, *19*(3), 174-185.

Rowe, G., & Frewer, L. J. (2005). A typology of public engagement mechanisms. *Science, Technology, & Human Values*, *30*(2), 251-290.

Rowe, M. J., Finley, J. B., & Baldwin, E. (2017). Accountability or Merely" Good Words"? An Analysis of Tribal Consultation Under the National Environmental Policy Act and the National Historic Preservation Act. *Ariz. J. Envtl. L. & Pol'y*, *8*, 1.

Saltmarsh, J., & Hartley, M. (Eds.). (2011). *" To serve a larger purpose": Engagement for democracy and the transformation of higher education*. Temple University Press.

Schlosberg, D. (2003). The justice of environmental justice: reconciling equity, recognition, and participation in a political movement. *Moral and political reasoning in environmental practice*, *77*: 106.

Senecah, S. L. (2004). The trinity of voice: The role of practical theory in planning and evaluating the effectiveness of environmental participatory processes. *Communication and public participation in environmental decision making*, 13-33.

Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic change*, *152*(2), 239-257.

Sprain, L. (2016). Paradoxes of public participation in climate change governance. *The Good Society*, *25*(1), 62-80.

Tonkiss, F. (1998). Analysing discourse. In *Researching society and culture*, 245-260. London: Sage Publications.

USACE. (2016). Identifying and Engaging Socially Vulnerable Populations in the USACE Decision-Making Process. https://www.iwr.usace.army.mil/Portals/70/docs/iwrreports/Identifying_and_Engaging_Socially_Vulnerable_Populations_%20IWRv2_08_01_2016.pdf?ver=2016-08-11-125141-427. Accessed 21 September 2020.

Van Dijk, T. A. (2001). Multidisciplinary CDA: A plea for diversity. *Methods of critical discourse analysis*, *1*, 95-120.

Whyte, K. P. (2016). What Do Indigenous Knowledges Do for Indigenous Peoples?. In *Keepers of the Green World: Traditional Ecological Knowledge and Sustainability*, Nelson, M. K., & Shilling, D. (eds). Cambridge, UK: Cambridge University Press.

Young, I. M. (1990). *Justice and the Politics of Difference*. Princeton University Press.

CHAPTER 2: "LIVING ON THE EDGE IN A WORLD WHERE CLIMATE CHANGE IS COMING": EXPLORING PLACE ATTACHMENT THROUGH THE LENS OF COASTAL COMMUNITIES IN SOUTHERN MAINE

2.1 Introduction

As the effects of climate change become more rapid and recognizable, communities are faced with making increasingly complex management and policy decisions about how best to respond. Coastal regions account for less than 2% of the Earth's landmass, yet they are home to approximately 1 billion people and the majority of the world's mega cities (Marino 2018). The communities located in these coastal regions face distinct challenges due to their exposure to natural hazards. Rising sea levels, more intense storm activity, and increased coastal erosion are exacerbating the risk of flooding and negatively affecting infrastructure, ecosystems, property values, and livelihoods (Marino 2018; Dupigny-Giroux et al. 2018; Oppenheimer et al. 2019). A variety of coastal adaptation options exist, including the development of hard (e.g., elevated structures, sea walls) and soft (e.g., wetlands, estuaries, dunes) infrastructure (Susskind et al. 2015; Oppenheimer et al. 2019).

However, these options may reduce risk only in the near-term, on the decadal scale. A long-term option – strategic relocation of human communities out of harms way, sometimes referred to as managed retreat - has rapidly gained traction among researchers, managers, planners, and even the media as an adaptation strategy in coastal areas where permanent human habitation may not be viable for physical, political, and/or financial reasons (see, for example, Koslov 2016; Hino et al. 2017; Earth Institute 2019; Science Friday 2019). Though no universal definition exists, managed retreat is generally described as an approach to relocation that seeks to reduce hazards to coastal communities by strategically moving, demolishing, or abandoning waterfront buildings and other hard infrastructure in order to allow for inward movement of the shoreline (NOAA 2007; Hino et al. 2017). Because it is a long-term, fundamental change in a system, managed retreat is considered a form of transformative adaptation (Hino et al. 2017).

Although it represents a promising option for strategic adaptation, managed retreat raises difficult questions about the social, economic, cultural, political, and legal aspects of responding to climate change impacts, collectively known as the human or social dimensions of climate change, such as land use policy, property rights, livelihoods, and emotional attachment to place (Agyeman 2009; Marino 2012; Siders et al. 2019). Siders (2019) argues that managed retreat has

the potential to actively cause harm through "loss of community, local tax revenue, and sense of place" (pg. 240). In other words, managed retreat may reduce some risks while amplifying others. Understanding these social dimensions is critical to identifying and overcoming the challenges associated with developing effective adaptation plans and policies, including those that may include relocation of people away from coastal hazards (Adger et al. 2009; Marino 2018; Siders 2019). However, planning and policy surrounding managed retreat has so far tended to focus more on the technical details of moving people and infrastructure out of areas that are existentially threatened by climate impacts (Bertana 2019; Siders 2019). There is, therefore, a need to conduct research on the social dimensions of climate change adaptation that is relevant for and can be applied to planning and policy processes related to managed retreat.

This study explores a specific social dimension known as place attachment in the context of coastal communities where the impacts of sea level rise, coastal erosion, and increased flooding pose a threat to the long-term habitability and potentially the very existence of place. Place attachment describes the ways that people are connected to place through social, emotional, and psychological processes (Scannell & Gifford 2010). Place attachment can help to provide insight into how people experience and respond to change in place (Agyeman et al. 2009; Adger et al. 2013). Social dimensions like place attachment are critical when it comes to assessing climate risk, vulnerability, adaptive capacity, and resilience, as well as determining adaptation priorities and pathways.

2.2 Theoretical Background and Literature Review

Before going into further detail about social dimensions, it is useful here to discuss some of the terminology of climate change adaptation to clarify what these commonly used terms refer to. The Intergovernmental Panel on Climate Change (IPCC) maintains a glossary of climate change terminology that serves as a valuable reference when parsing through definitions of concepts that are often closely related (IPCC 2018). Adaptation itself, in human systems, refers to the adjustments made over time to respond to actual or anticipated changes in the climate and the effects those changes bring. Risk, in the climate context, refers to the potential of negative outcomes for human and natural systems due to climate impacts but where there is a degree of uncertainty about the occurrence or extent of any given outcome. According to the IPCC (2018), "Risk results from the interaction of vulnerability (of the affected system), its exposure over time (to the hazard), as well as the (climate-related) hazard and the likelihood of its occurrence."

Vulnerability here refers to the susceptibility of people or places to be adversely affected by climate change and is a function of three dimensions: exposure, sensitivity, and adaptive capacity. Exposure relates to the degree to which something (people, place, property, etc.) could be affected or "touched" by natural hazards; sensitivity relates to the degree to which exposure could lead to harm or damage; and adaptive capacity relates to the degree to which harm or damage could be mitigated if action was taken to reduce exposure and sensitivity. In other words, adaptive capacity refers to the ability of systems (human and natural) to adjust to changes, respond to challenges, and/or take advantage of opportunities associated with a changing climate. Within the realm of climate change, resilience refers to the ability of social-ecological systems to cope with change and to respond in ways that maintain core characteristics of the system while also preserving the capacity to adapt, learn, and transform (IPCC 2018).

Although factors such as physical exposure to hazards are a component of climate risk, there are a variety of social considerations that ultimately determine whether or to what extent people are impacted and what their capacity is to respond (NRC 1999). In climate change science, these considerations have come to be known as human or social dimensions, and they encompass a wide range of dynamics, including: political, cultural, economic, technological, livelihoods, knowledge, ethics, behavior, attitudes, values, risk perception, population dynamics, human health, governance systems, formal and informal institutions, decision-making, use of scientific information, and attachment to place (NRC 1999; Adger et al. 2013). In addition to mediating the consequences of and responses to climate change, social dimensions also frame the processes, relationships, and systems that govern human interaction with the environment, including how individuals and communities make decisions about adaptation (NRC 1999). Social dimensions play a central, albeit sometimes hidden, role in adaptation planning, policy, and practice. Climate change adaptation is ultimately a socially constructed process, where decisions about which adaptation options to pursue (if any) are informed by adaptation goals that are fundamentally tied to values (Adger et al. 2009). Ethical questions arise when considering whose goals, whose values, and ultimately, whose vision of the future matter. If adaptation goals and the values that underlie them are not explicitly stated or deliberated upon, conflict is likely to occur among diverse stakeholders (Adger et al. 2009).

One social dimension that is especially relevant in the context of considering the challenges and opportunities of climate change adaptation strategies like managed retreat is place

attachment. Place attachment is concerned with the extent to which a person feels connected to an environment that is meaningful to them (Adger et al. 2013; Marshall et al. 2012). Theories about place attachment first emerged in the literature with Tuan's (1974) concept of ''topophilia'' or love of place. Place attachment has since come to be understood as an affective bond between people and place (Altman and Low 1992). Scannell and Gifford (2010), in an attempt to organize a diversity of theories and models of place attachment, developed a tripartite framework comprised of person, process, and place (Figure 3). They explain,

> The first dimension [person] is the actor: who is attached? To what extent is the attachment based on individually and collectively held meanings? The second dimension [process] is the psychological process: how are affect, cognition, and behavior manifested in the attachment? The third dimension [place] is the object of the attachment, including place characteristics: what is the attachment to, and what is the nature of, this place?"(Scannell and Gifford 2010, pg. 2).

Place attachment covers both the process of how people become attached to place as well as what the outcomes of attachment to place are (e.g., an emotional bond) (Scannell and Gifford 2010; Devine-Wright 2013). Manzo and Devine-Wright (2014) note, though, that most studies focus on aspects of attachment itself, rather than aspects of the attachment process.

Of course, both the places and the people who are attached to them change over time. Places change as a result of many drivers: economic development, population change including in and out migration, legal designations, and environmental impacts, for example (Devine-Wright 2013). Thus, attachment can be impacted to varying degrees depending on the dynamics of how place changes, including the extent of change, pace of change, and level of or ability to control change (Devine-Wright 2013). However, much of the place attachment literature and frameworks, including Scannell and Gifford's, present place as static rather than dynamic. Brown and Perkins (1992) address the concept of disruption to place attachment as a result of voluntary relocation (e.g., going away for college) and involuntary relocation (e.g., environmental disasters), describing different stages as pre-disruption (anticipation of or preparation for detachment from place for voluntary relocation or the nature of attachment in the case of involuntary relocation), disruption (breaking of attachment), and post-disruption (effort to remain attached to existing but changed place or build new attachment elsewhere). However,

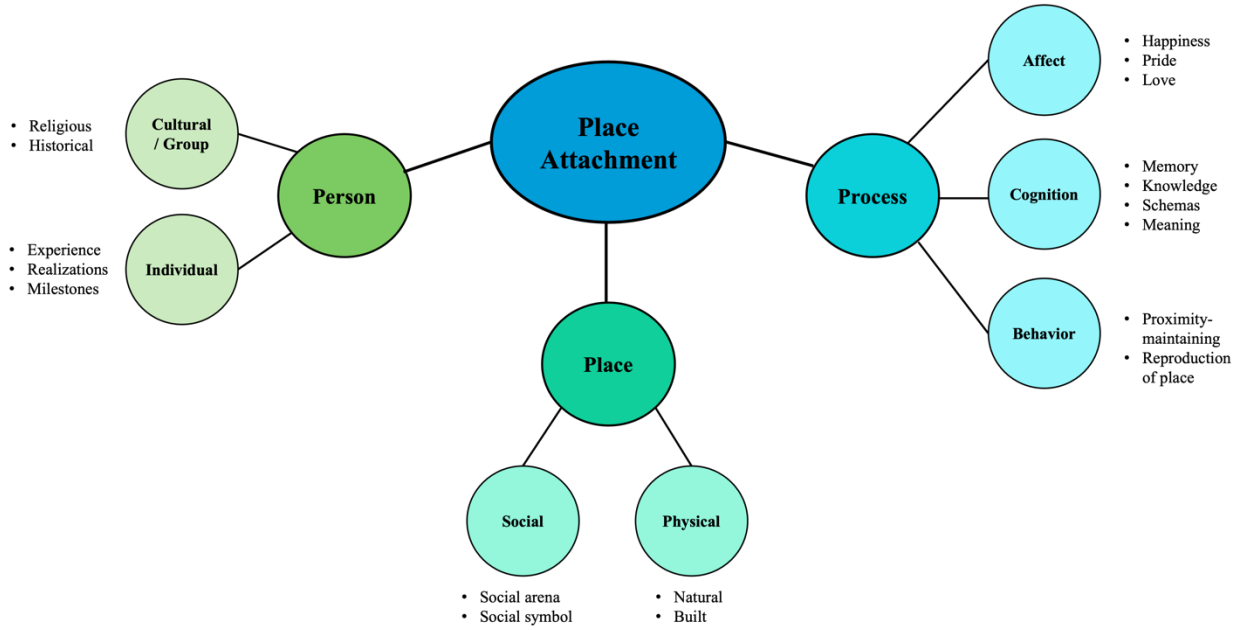

Figure 3: **Tripartite model of place attachment** (Adapted from Scannell and Gifford 2010)

there has been a lack of place attachment research exploring how people-place bonds evolve in response to slower, ongoing change over time.

In the context of climate change adaptation, place attachment can be a powerful motivator or inhibitor of action and change (Agyeman et al. 2009; Marshall et al. 2012; Adger et al. 2013). Manzo and Perkins (2006) argue that place attachment is an important and underutilized element in fostering community engagement in planning in that it can motivate participation. People's attachment to place has also been shown to contribute to improved community resilience outcomes: a desire to protect and preserve the characteristics of place that they value motivates people to take stewardship and adaptation actions that address climate change impacts on place (Faulkner et al. 2018; Rajala et al., 2020). Tournois and Rollero (2020) refer to this dedication to remain in place through adaptive efforts "place commitment."

One reason that place attachment is an important social dimension of a strategy like managed retreat is that place is intertwined with culture, including identity, traditions, and language (Burley et al. 2007; Agyeman et al. 2009; Adger et al. 2013). This not only makes the prospect of (voluntarily or involuntarily) leaving and/or losing access to a place deeply emotional, it also poses a potentially existential threat to place-based cultures (Adger et al. 2013). Place attachment can also mediate one's perceptions or understanding of environmental change, and relatedly, impacts from phenomena like climate change may also serve to further

strengthen attachment if a place is seen to be fragile or at risk (Burley et al. 2007). Place attachment, therefore, plays an outsize role when individuals or communities are making decisions about how to respond to climate impacts such as sea level rise, including whether or not they should relocate. Despite the influence that place attachment has on decision-making, it is an under-explored social dimension of climate change adaptation policy and planning (Marshall et al. 2012).

2.3 Description of Study Site

This study was conducted in Wells, a small coastal town located in southern Maine, a state in the far northeastern region of the US. The town is situated on the Atlantic Ocean, featuring seven miles of coastline and an extensive network of estuaries and salt marshes (see Figure 4). The town is home to approximately 11,550 year-round residents (US Census Bureau 2020); however, as a popular location for coastal recreation and tourism, its population grows to nearly 30,000 during the summer months (Susskind et al. 2015). According to recent US Census demographic data (2020), the town is 94.8% white, has a median income of $66,946, and is home to a large population of people aged 65 years and over (25.6% of the total population in Wells, compared to 16.8% in the state of Maine). The coastal communities in the town are characterized by having ocean on one side and salt marsh on the other side, connected by estuary systems to the areas of town further inland.

Like other coastal communities throughout the U.S. and around the world, sea level rise is a major cause for concern in the town. The mean tidal range for the is 8.79 feet, with a highest astronomical tide of 15.4. Nearly all of the land along the coast in Wells is in the FEMA 100-year floodplain. Local climate projections indicate that by the end of the century, the town is expected to experience nearly two feet of sea level rise under a low emissions scenario, or more than four and half feet under a high emissions scenario (Susskind et al. 2015). The Maine Climate Council recently released recommendations that towns should commit to manage for 1.5 feet of sea level rise by 2050 and 4 feet by 2100, but also that they should be prepared to manage 3.0 feet of sea level rise by 2050 and 8.8 feet by 2100 (Maine Climate Council 2021). Precipitation patterns are also projected to change, with an overall trend of more precipitation

annually, particularly in winter. Combined, sea level rise and heavy precipitation events amplify the risk of storm surges, flooding, and coastal erosion (Dupigny-Giroux et al. 2018).

Preventing and responding to the potential damages associated with climate change impacts will be a challenge for coastal communities like the one in this study. While the majority of year-round residents in the town live further inland, the town's limited tax base is largely dependent on the seasonal residence and tourism industry (Susskind et at. 2015). The natural and built amenities that support seasonal residents and visitors (e.g., beaches, homes, businesses, etc.) are primarily located along the waterfront (Susskind et at. 2015), therefore, damages to the

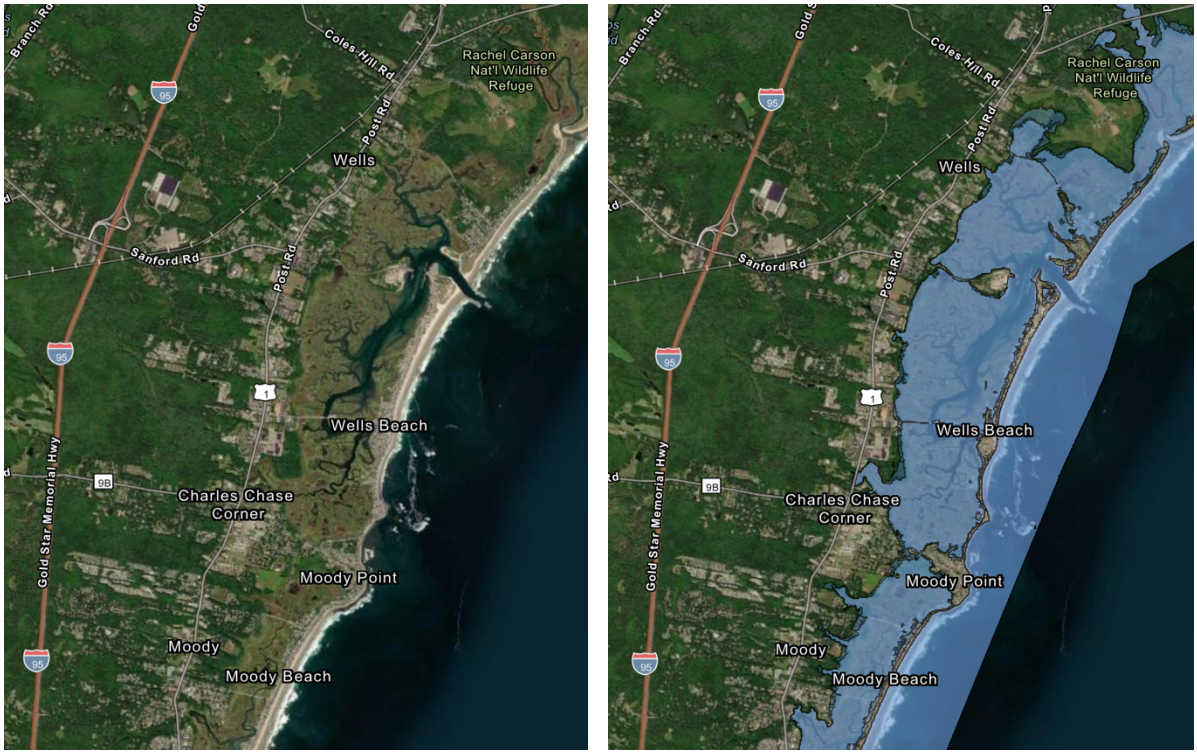

Figure 4: Coastline of Wells ME (right) with 1.6 / 3.9 feet sea level rise projection (left). Images captured from SMPDC's Regional Coastal Vulnerability and Exposure Mapper

social and ecological systems that make the town an attractive destination for seasonal recreation and tourism pose a serious threat to the local economy (Dupigny-Giroux et al. 2018). A recent economic resilience assessment estimates that, "over 130 jobs, almost $4 million in labor income, over $6 million in area gross domestic product, and over $10 million in revenue [in Wells] may be affected in some way by sea level rise and storm surge" (SMPDC 2022). As well, the assessment estimates that $864.9 million in property value is at risk in the 1.6 feet sea level rise scenario, and $1.08 billion at risk in the 3.0 feet scenario (SMPDC 2022).

The prospect of potentially needing to relocate housing, businesses, and other infrastructure away from the coast raises questions about who would benefit from relocation in Wells and whose voices would matter in the decision-making process (Marino 2012; Siders 2019).-The town is working to reduce its vulnerability to climate impacts through the integration of flood hazard mitigation and sea level response strategies in municipal planning activities, but progress has been slow. Conversations about the potential need for managed retreat in Wells have not yet begun in earnest but there is a desire among those working on climate adaptation and resilience locally to engage the public in dialogues about the range of options that the town will likely have to consider as the impacts of sea level rise become more severe.

2.4 Methodology

This study used Photovoice as a method for exploring the dynamics of place attachment in coastal communities where place is undergoing long-term change. Photovoice is a qualitative, participatory method that is useful for exploring community knowledge, experiences, perceptions, and aspirations, particularly with people who do not typically participate in decision-making processes (Wang and Burris 1997). The core component of the method involves asking participants to take photos related to a particular research interest or question over a specified period of time (e.g., a month), to write narrative reflections about their photographs, and to then participate in a process of group-based image sharing and reflection (Baldwin et al. 2017). According to Wang and Burris (1997), who are credited with developing the approach, Photovoice is "a process by which people can identify, represent, and enhance their community through a specific photographic technique. It entrusts cameras to the hands of people to enable them to act as recorders, and potential catalysts for change, in their own communities" (p. 369). The goals of Photovoice include: recording and reflecting on community strengths and weaknesses; facilitating critical dialogue about issues through group discussions about photographs; reaching policy makers; and promoting community change (Wang & Burris 1997). The ultimate goal of Photovoice is to use the images and voices of the participants to inform decisions, strategies, and policy-making.

This Photovoice project was conducted with participants who reside in coastal neighborhoods in the town of Wells, Maine. This research focused on exploring the knowledge, perceptions, experiences, and aspirations of people who have relationships with place that extend over time in coastal areas that are experiencing environmental change; thus, recruitment of

participants followed a purposive sampling strategy (Etikan 2015) and targeted people who had lived in the coastal neighborhoods, either seasonally or year-round, for at least two years. Recruitment began by working through leaders in community-based organizations (e.g., a land trust and an advocacy group), who provided email contact information and connection to potential participants. Recruitment messages were also shared via active neighborhood groups on Facebook. Initially, the project focused on one neighborhood (Drakes Island, referred to as Community 1), however, when recruitment and retention of the targeted number of participants (n=10-12) proved challenging with that community, a second neighborhood (Moody Beach, referred to as Community 2) featuring similar social and ecological characteristics was added to the study. Recruitment proceeded in the same way with community 2, two months after data collection in community 1 was completed.

2.4.1 Sample Population

A total of 26 people responded to the recruitment emails or social media posts to indicate interest (n=13 in both communities), of which 20 people (n=9 in Community 1 and n=11 in Community 2) participated in virtual introductory trainings, discussed below. Following the trainings, a total of 12 participants (n=5 in Community 1 and n=7 in Community 2) completed the full Photovoice process detailed below, while the remaining 8 either no longer responded, indicated that they did not have the time to participate, or would not be the in the area during the time of the study. As an incentive, participants were each provided with a $75 stipend after completion of data collection.

The 12 participants who completed the Photovoice process (see Table 4 for details) were all property owners (individually or with family members) who either lived in the area year-round or seasonally. For the seasonal residents, these places are second homes during part of the year, typically late spring through early fall. The age range of participants spanned from 23 to 78, with the majority of participants being of retirement age. The length of time connected to place ranged from people who had been spending time in these places since they were born to those who had resided in place for approximately the last 10 years. The Photovoice process in both communities spanned the period of three months; however, the process in Community 1 took place from June to August (summer in the northern hemisphere) and, for Community 2, it took place from October to December (late fall to winter in the northern hemisphere). This is

worth noting because there are seasonal differences (both social and environmental) between these time periods that potentially shaped the types of images that participants submitted.

Table 4: Description of Sample Population

Neighborhood	# of Participants	Year-Round (YR) / Seasonal (S)	Age Range	Male (M) / Female (F)	Project Time Period
Drakes Island (Community 1)	N=5	2 YR / 3 S	23-78 Years	4 M / 1 F	June – August 2021
Moody Beach (Community 2)	N=7	3 YR / 4 S	55-74 Years	3 M / 4 F	October – December 2021

2.4.2 Data Collection

The components of data collection in the Photovoice process varies from project to project but can include a combination of an introductory training session, one-on-one interviews, a focus group, and a public display of photographs. The approach taken by this project involved the following steps:

After recruiting participants, two introductory training sessions (one for each community) were held to provide information on the purpose of the project and the steps involved. Participants were provided with a protocol to guide the photography process, including photo prompts, the number of photos to take, suggestions for writing narrative statements to accompany photos, and how to submit their materials when completed. There was an option to borrow a digital camera for the project, but all participants chose to take photos with their cell phones. Participants were asked to take photographs that responded to the question, "When it comes to [this place], what do you care about most?" and to submit at least one photograph that depicted each of the following:

- A physical location or natural feature in [this place] that is special to you
- An activity that you enjoy doing in [this place], either by yourself or with others
- Something that recalls a memory or experience in [this place]
- Anything that you might be concerned about in [this place]

Participants were instructed to take as many photographs as they'd like over the period of two weeks to one month and to choose between 5 – 15 photographs to submit. It is important to note that multiple participants asked about the possibility to submit historical photos that helped to depict aspects of their attachment over time. After discussion with the groups, participants were allowed to submit photographs that had already been taken by them or their family members as long as they clearly responded to the guiding question.

The guiding question, along with the prompts, were designed to be broad enough to capture the different dimensions of place attachment (e.g., people, process, place) as well as any types of issues or challenges that people experience in their relationship with place. Climate change was not mentioned in either the guiding question or the prompts; this choice was made intentionally in order to see if participants would identify climate change as an issue that they had experience with or were concerned about.

Once participants submitted their photographs and narrative statements, semi-structured, in-depth interviews were conducted with each individual participant. Interviews focused on gaining a deeper understanding of the dynamics of each participant's attachment to place. Note: this paper focus on the analysis of the photographs, narrative statements, and focus group discussion data; one-on-one interview methods and analysis are detailed in Chapter 3.

Following completion of the one-on-one interviews, participants received physical copies of 8.5x11 inch booklets that contained all of the photographs and narrative statements from their respective communities, de-identified and arranged randomly. Participants were requested to spend half an hour reviewing the booklet prior to the group discussions, to jot down their reflections and make note of any common themes, similar stories, and/or shared concerns. Approximately 1-2 weeks after receiving the booklets, participants took part in a facilitated focus group discussion (one per community) where they reflected on each other's photos and engaged in dialogue about shared cares and concerns related to place. Both discussions were held virtually via Zoom and lasted for 1.5 hours. Focus groups are useful for gaining a deeper understanding of perspectives, including eliciting differences in knowledge and understanding between participants and communities (Krueger & Casey 2009). In the context of Photovoice, focus group discussions facilitate collaborative learning and shared sense-making (Wang & Burris 1997). They also serve as an opportunity for participants to take part in data analysis through the participatory identification of key patterns and themes across the photographs and

narrative from their respective communities (Wang & Burris 1997). Focus group discussions were audio recorded and transcribed into text files.

Finally, selected photographs and narratives statements, grouped by key themes that emerged during focus group discussions and through initial analysis of the data, were displayed as an exhibit in a gallery space at the Wells National Estuarine Research Reserve for the period of five weeks during the summer of 2022. A public opening event was held to foster broader community engagement with the project. 9 out of the 12 participants were able to attend the opening event, most of whom brought family and friends along with them. The exhibit was also displayed as part of a regional coastal resilience planning meeting attended by approximately 25 decision makers from southern Maine, which prompted reflection on the social dimensions of climate change impacts and responses.

2.4.3 Data Analysis

In addition to the participant's initial analysis, which serves as a qualitative research validity procedure referred to as member checking (Cresswell and Miller 2000), narrative statements (n=133) and focus group discussion transcripts (n=2) were analyzed qualitatively alongside photographs using an emergent coding process, resulting in a codebook that was used to identify additional patterns and themes (Miles et al. 2014). Three researchers (the lead researcher / project facilitator plus an academic advisor and a community-based mentor) reviewed the photo booklets from the two communities and separately developed initial code lists based on themes and patterns that emerged from the data. The researchers then met to discuss and compare their lists. The lead researcher synthesized the lists, along with the patterns and themes identified by participants during the focus group discussions, to create a working codebook. The lead researcher then worked with the two researchers who developed the initial code lists plus two additional researchers (graduate students in the same lab at the lead researcher) to apply the in-development codebook to a selection of narrative statements during two, 1-hour meetings. Working independently, each researcher analyzed 5 narrative statements at a time, coming back together to compare outcomes, discuss coding strategy, work through questions or disagreements, and streamline code definitions to improve validity and reliability of the codebook and its application.

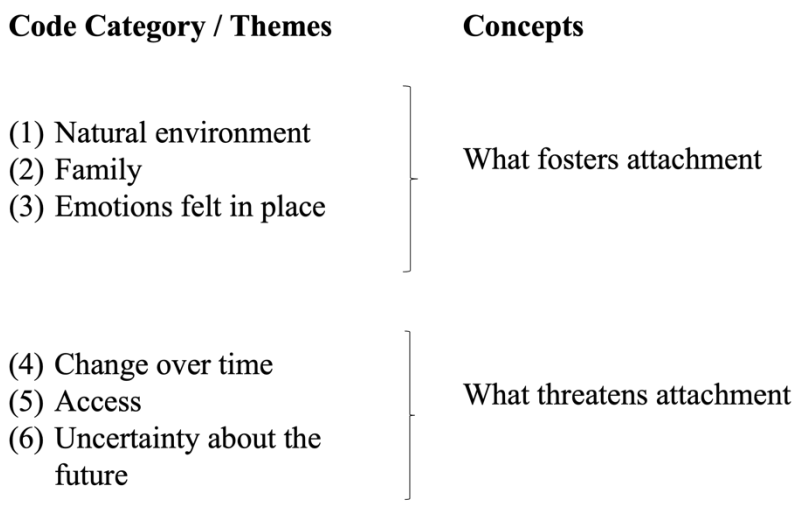

Figure 5: Mapping Code Categories / Themes to Concepts

Once the codes were saturated and stable, with no new codes emerging (Mason 2010), the final codebook included 64 total codes (10 main codes, 16 primary subcodes, 18 secondary subcodes, and 20 tertiary codes), with definitions, and examples for each code (see Appendix G). The lead researcher applied the final codebook to the photo booklets and the focus group transcripts from the two communities using Dedoose, a qualitative analytical and organizational software. Coded text was extracted from the data and placed into data display tables organized by main code and subcodes (Rubin & Rubin 2012)**,** with tags indicating which community the data originated from to allow for cross comparison. Memos and summary statements were used to interpret the data (Rubin & Rubin 2011; Miles et al. 2014). From this analysis emerged seven primary code categories: 1) natural environment, 2) family, 3) emotions in place, 4) change over time, 5) access, 6) uncertainty about the future, and 7) protection. Following Saldaña's (2014) codes-to-theory model (see Figure 5), further analysis of the excerpted data associated with these code categories was conducted to identify two primary themes – the dynamics that foster attachment to these places and those that threaten attachment – detailed below.

2.5 Results

2.5.1 Factors that foster attachment

Several factors emerged as dimensions of what attaches people to these places, including the dynamic characteristics of the natural environment as well as the relationships and emotions that are closely connected to or fully embedded in place.

Both of the communities in this study are characterized by a dynamic, coastal environment. Participants frequently described their fascination with and appreciation of the constantly changing environmental conditions, including the tides, the colors, the lighting, and the weather, that change from minute to minute, hour to hour, day to day, and season to season. One participant referred to these coastal dynamics as the "personality of place" and several participants talked about their deep appreciation for ever-changing views. For example, these places are cherished for the wide, flat, sandy beaches that emerge twice a day between high and low tides, as well as the tidal marshes that support an abundance of wildlife. Several participants described the land- and seascapes as unique places to observe natural phenomena. For example, several participants from community 2 described witnessing the power and drama of coastal storms in these places as an exhilarating experience.

Figure 6: Participant Photo 1 - *"This picture captures two extraordinary elements of Moody [Beach]. First, the tidal difference. Where else on earth does one get a "new beach", hundreds of yards wide, a (mostly) hard and flat playground, twice a day? While tides elsewhere in Maine exceed the 9.5 foot average at Moody, nowhere north of Portland can match the beaches of Wells/Ogunquit/York for this extraordinary natural phenomenon. And second: Moody provides weather and sky watching vistas, constantly changing. Soothes my soul."*

All participants across both communities referred to the beauty of the natural, physical features of place, but it's not simply the aesthetic value that these places hold for the participants. Rather, it is about how they feel when they are surrounded by the beauty of place. For many participants, being present in and observing the dynamic natural environment of these places evokes emotions, memories, and reflective thoughts. Participants regularly expressed the feelings they have when they are in place, for example, awe, gratitude, connection, and belonging. As one participant described, "Every single day, nature paints a different landscape. And it's not just once a day, it's like every moment…I just love looking at the landscape, looking at where I live, the sense of place, and seeing the ever-changing landscape that makes my life so darn interesting." In this way, it is the emotions that place itself evokes – how people feel when they are in place - that supports the attachment process of building emotional bonds with place.

Figure 7: Participant Photo 2 - *"My father used to call this place heaven. Above the marsh, I spot an egret "angel" spreading its wings fully in flight. Moments like this make me think of my father and smile. Living here, enjoying our home and the beautiful nature and setting makes me feel a strong connection to him still."*

For some, witnessing the short-term environmental changes is also a regular reminder of the natural rhythms, cycles, and patterns of life, which prompts participants to reflect on the passage of time. As well, participants seem to have more time or space to engage in this type of reflection while they are in these places. Another temporal dimension of attachment to place also emerged in photos and discussions, in which place acts as a kind of conduit between the past and the present for some participants, especially with regard to generations of family. For example, participants from both communities described a feeling that witnessing the beauty associated with the dynamic nature of these places allow them to continue to feel connected to people who are no longer physically with them.

Figure 8: Participant Photo 3 - *"Deep and meaningful family history at Moody Beach, 1911-2021. Owning beachfront property to low tide is a cherished and treasured gift spanning 5 generations of family descendants."*

In fact, another core aspect of what makes these places special for participants is that they are shared with family. Participants from both communities shared the sentiment that these are gathering places that foster intergenerational connections and serve as the backdrop for family

events and milestones, meaning that place itself plays a central role in participant's memories of important moments in time. Nearly all participants described relationships with place that span across multiple generations of their families, both in terms of successive generations having connections over time as well as several generations connecting in place together at the same time. In some cases, place itself was described in ways that made it sound like a member of the family. Many participants expressed a strong conviction for the need to be good stewards of these special environments for future generations.

2.5.2 Factors that threaten attachment

Distinct threats to people's attachment to these places emerged, including environmental change over time, physical access to place, and a sense of uncertainty about the future.

Figure 9: Participant Photo 4 - *"This is a view from the patio looking out on the ocean. There are many chairs because part of the charm of this place is the people that share it. The view is one of the things that I most look forward to when I am not there. I could look out on that view for hours. The ocean constantly changes and is endlessly fascinating. This section of Moody Beach has changed over time, too. I remember it from 50 years ago. It seems like the level of the beach has dropped relative to the cottages on the beach. Also, at this point in the beach, the high tide now regularly comes up to the sea walls of the cottages; whereas 50 years ago that was a rare event."*

The same dynamic characteristics of the coast that make these two communities special to participants also make these places vulnerable to the effects of longer term environmental changes. Nearly all participants shared personal observations of change over time in their photographs, narrative statements, and during focus group discussions. Examples of these changes include rising sea levels, stronger storms, and increased coastal erosion. Participants noted a tension between the short-term, dynamic changes that make these places special to them and the long-term, existential change that makes them feel worried or anxious: “It's a paradox in that we all enjoy the daily changes, seasonal changes at the beach, that's part of what makes it so nice. And yet, it's difficult to acknowledge that there are these subtler changes happening over decades.”

Related, at least in part, to change over time is the issue of access, which came up frequently in photos and group discussions. In the context of these two communities, considerations about access include how these places are physically accessed and who has access to them. Both communities are surrounded by water, with tidal marshes on one side and the ocean shore on the other, meaning that physical access is gained via roads that traverse over water. Participants documented that during especially high tides or storm events, physical access to and from these places can be limited or even impossible due to flooding on the roads that cross the marsh systems and connect the communities to the rest of town. This is a concern in both communities but it is especially worrisome for Community 1 where there is only a single road that provides access to and from the area. Participants in this community have observed the tides on either side of the road getting higher over time.

Who has access to the beach can be a complicated question in Maine, where private property holders typically own to the low tide mark, meaning that the public is prohibited from using the beach except for the purposes of fishing, fowling, and navigation or via public right of ways. Beach ownership is an especially sensitive issue in Community 2 because it has a history of dividing people. For some, the inability to freely access the beach is a disruption to their relationship with place, but for others, private ownership of the beach is part of what makes place special for them. Higher high tides also play a complicating factor regarding who has access and when: Participants from both communities noted that where it used to be possible to walk the full length of the beach throughout the tide cycle, stretches of the beaches are now regularly inundated up to sea walls during high tides.

Figure 10: Participant Photo 5 - *"Another sign of the weather we experience at Moody Beach. Sometimes it means you have to find another way to the beach!"*

Many participants attributed the longer term environmental changes that they have observed specifically to climate change, citing the issue as a pressing concern for their communities. For example, one participant stated, "Well, you know, that's, that's living on the edge in a world where climate change is coming…if you were to ask me, what is the biggest threat to our community? That's it." The impacts of climate change on place were discussed as a concern both in the present as well as for the future. The emotions associated with witnessing place change over time in front of their eyes were described by participants as worry or anxiety and translated into a sense of uncertainty about what the future holds for these places. Participants expressed a range of questions about and visions of what the future might look like in these places. For example, a participant wondered, "If you look at it from even a longer-term perspective, if you look at some of the studies that have been done projecting into the future as a question, will [this community] be there, not just will the beach be there, but will [this community] be there, if we have significant sea level rise?" And, for one of the participants who owns a home that is not on the oceanfront, they expressed that, "Our house is not on the beach, but I expect it will be someday."

Figure 11: Participant Photo 6 - *"My biggest concern for Drakes Island is the consequence of global warming…As you drive onto the island, the marsh is on the right. It is a large marsh with considerable grass. As a teenager I remember seeing the grass completely covered only during a hurricane. Now it is often covered just because there is a full moon."*

Given the depth of care that participants feel towards these places, there is a strong interest in pursuing protective strategies that respond to observed changes and protect place now and into the future. Because of the proximity to the ocean, nearly all of the beachfront homes in both communities already have sea walls. However, participants highlighted a variety of shortcomings related to armoring strategies that utilize hard infrastructure like sea walls, rip rap (large rocks or boulders used as retaining walls), and jetties, including exacerbated coastal erosion in some areas and accretion in others, which reinforces the threat of disrupting place attachment. State law currently prohibits homeowners from altering or replacing existing sea walls or building new ones, even as they become less effective in the face of sea level rise. This has spurred at least one participant to pursue a temporary modification (see Image 8) that highlights the extent to which residents are willing to invest in adaptive strategies at the individual level. For some, though, approaches like sea walls are seen as an ultimately temporary solution to long-term change: "What is the solution that we're going to come up with, that's going to save [this community] from sea level rise? Sometimes it feels a little bit like you're up against an unsolvable problem…like we could build a new seawall or raise the houses up, but that's more

of a band-aid." While some participants are exploring the option of more nature-based solutions (e.g., dune grass), others express skepticism about the long-term viability of dealing with the potentially repetitive cycles of damage and recovery, wondering "At what point do you decide, this is economically not sensible to stay here?"

Figure 12: Participant Photo 7 - *"Armed and Protected. Temporary straw bales sit atop my seawall providing an additional two feet to hold back the sea during winter storms. I tried this line of defense for the first time last year in 2020 and it worked so well that I plan to install them every fall."*

2.6 Discussion

This study explored the dynamics of place attachment with people who have long-term relationships with coastal places that are being impacted by climate change. Through photographs, narrative statements, and focus group discussions, participants shares what makes these places special to them, including what they care about most and what they are most concerned about. Two major themes emerged: factors that facilitate the building of emotional bonds with place and factors that threaten to unravel attachment to place. In exploring these themes, three key takeaways can be identified: 1) the dialectical nature of environmental change in coastal places; 2) the contribution of the physical environment in facilitating place attachment; and 3) the multi-dimensionality of emotions and their potential impacts on planning. These results shed light on the types of social dimensions that can help and/or hinder processes for

identifying and implementing coastal management strategies that respond to climate change impacts like sea level rise, coastal erosion, and increased storm surge. The outcomes of this research are useful for those involved in climate adaptation and coastal resilience efforts, including (but not limited to) land use planners, policy makers, engagement practitioners, and citizens.

The findings of this research contribute to the understanding of place attachment in dynamic, coastal environments where natural hazards are being exacerbated by climate change. People are drawn to live, work, and visit coastal areas because they are a nexus of social, cultural, ecological, and economic assets and activities (Fleming et al. 2018). The coasts can also pose more risk to human communities due to their exposure to natural hazards (DeSherbinin 2012). In this way, coastal areas are highly attractive to people but they also pose danger to them. The majority of participants in this study are people who have chosen to reside on the coast later in life because of the affective benefits they gain from being in place. Yet, participants highlighted their own dialectical relationship with dynamic aspects of place, specifically as they relate to environmental change. On the one hand, short-term changes that are a natural characteristic of the coast endeared people towards place because of the positive affective responses they elicited. On the other hand, the long-term changes that are associated with climate change are amplifying those natural characteristics in ways that are making place less predictable and more hazardous, which evokes negative affective responses.

The tension here between people loving a place because, as participants described, it is constantly changing and them feeling apprehensive about the looming threat of change offers an opportunity to explore thresholds for tolerance of change among residents with strong place attachment to dynamic coastal systems. Better understanding of the types and extent of risk (perceived or real) that people are willing to accept can help shape adaptation pathways, for example, by identifying thresholds for action (Bronen 2015). As well, the local knowledge, observations, and experiences of place change that people gain through their place attachment, such as those shared by participants, can help to inform climate assessments (Burley et al. 2007). Participants also highlighted the extent to which witnessing place change over time and facing the possibility of having their attachment to place disrupted are emotionally charged experiences for them. Brown and Perkins (1992) discuss place disruption in the context of rapid environmental change, but for those experiencing longer-term change, it may be useful to rethink

or reframe the pre-disruption phase as being disruptive to place attachment in and of itself: as place changes, so too do the emotions that people experience in place, therefore potentially altering their attachment.

The connection between physical place and affect is interesting for a couple of reasons from a theoretical standpoint, especially the central role played by the physical environment in fostering place attachment. Much of the literature has focused on the people and process dimensions described by Scannell and Gifford's (2010) tripartite model (Figure 3), particularly in regard to the social aspects of place and how it facilitates connections between people (Scannell and Gifford 2010). The place dimension, especially the physical natural environment, is (ironically) a relatively underexplored aspect of place attachment. Manzo (2005) argues that, "It is the experience-in-place, rather than the places themselves that are meaningful" (pg. 75). Although part of what makes these places so special to participants is the positive emotions they experience in place, those feelings seem to arise as a result of the natural characteristics of the coast, suggesting that the physical environment may be a more essential piece of place attachment in areas that are exemplified by their natural beauty. These findings help to shed light on the underexplored physical place dimension of Scannell and Gifford's model (2010; Figure 3).

If it is the physical characteristics of a place's natural environment that people care about and value most, their attachment could motivate them to take action to protect or preserve those aspects of place (Faulkner et al. 2018; Rajala et al. 2020). Alternatively, as Burley et al. (2007) found, if people are emotionally connected to and identify with the physical characteristics of the areas they live in, they may become more strongly attached to a changing place in the face of rising risk. Exploring these connections between physical and affective aspects of place attachment deserves further attention, especially in the context of climate change altering the natural features of landscapes and seascapes of all varieties. Understanding what motivates people, whether it's to support place protective actions or to remain in a hazardous place or potentially both as in the case of the participants in this study, can aid in the development of adaptation strategies that are place-specific and tailored to the needs, values, and aspirations of communities.

The results also help to shed light on the importance of taking into account the social dimensions of climate change in adaptation planning and policy processes. Climate adaptation

and coastal resilience projects, including those that center around managed retreat, have tended to focus heavily on the technical details of the planning process, including the physical, logistical, and economic aspects of implementation (Bertana 2019; Siders 2019). In places where managed retreat has taken or is taking place (e.g., Staten Island, Louisiana, Alaska), communities have expressed frustration about the lack of understanding among planners and policy makers regarding the more social, cultural, and/or emotional dimensions of their experiences with relocating away from place that are meaning to them (Marino 2012; Koslov 2016; Maldonado et al. 2021). Participants in this study highlighted dimensions of their attachment to place that are more intangible but that nonetheless can be taken into account during adaptation planning processes. For example, for the participants who have a long-term connection to place that stretches over multiple generation of family, relationships with and memories of loved ones are embedded in place. Especially for those whose family members have passed, place serves as a link between past and present. These findings support those of Manzo (2005), who explains, "In some cases, places enabled the memory of people and events to emerge; in other cases, the memories of people and events enable places to emerge as significant" (pg. 78). Thus, managed retreat represents not only a disruption to or loss of physical connection with place, but also with the people and histories that are intertwined with place.

Many of the participants in this project, as well as those who own property in the coastal communities of Wells and other towns along Maine's coast more generally, are second homeowners. Second homeowners are often at risk to the effects of climate change because they have chosen to invest in properties through purchase or inheritance that fulfill their desire for certain aesthetics or amenities, which frequently translates to having homes in natural areas that are exposed to climate-related hazards (Adie 2020). However, second homeowners in coastal areas like the ones in this study may technically be less vulnerable than others residing in these areas: although they may have high exposure, their sensitivity is likely lower and adaptive capacity higher because they have access to the types of resources (e.g., financial and social capital) that could be marshalled to prepare for or respond to climate impacts. That adaptive capacity exists does not guarantee that it will come into play, which again raises the question of how to motivate people towards adaptive strategies and how place attachment can play a role. Participants in both communities used terms like worry, anxiety, and uncertainty to describe the emotions they are experiencing as they watch the places they are attached to change over time,

while also highlighting the steps they are personally taking to protect place. This fits with Adie's (2020) findings that, "Emotional responses to risk, i.e. worrying, have a significant impact on the implementation of defensive measures" (pg. 2). Of course, individual actions are not enough to stem the tide of climate change impacts, and defensive measure may not hold up in the long term.

It is critical here to address the relative wealth and privilege inherent in second home ownership specifically and more generally in residing in wealthy neighborhoods like the ones in this study, especially in light of other coastal communities in the US and around the world who are significantly more vulnerable to the impacts of climate change because they do not have access to the resources needed to support adaptive capacity. However, there are many towns and cities in places like Maine and elsewhere in the US that depend on the revenue generated by second home owners and seasonal residents, for example, through property taxes (Adie 2020). The prospect of these populations potentially opting to cut their ties with place in the face of increasing climate risk could mean that the services and facilities that year-round residents, including those who are more socially vulnerable, depend on will be impacted due to decreased operating budgets. The loss of such financial assets could also potentially undermine the broader adaptive capacity of the town if those resources are no longer available to support the implementation of resilience measures.

There are political aspects of place attachment that are not well represented in the literature but that are nonetheless important to consider in the context of climate change, namely, whether or to what extent people's emotional bonds with place play a role in planning and decision-making (Devine-Wright 2013). In the context of disruption to place attachment such as displacement following an environmental disaster, Manzo and Perkins (2006) suggest that understanding and recognizing the dynamics of emotional connections to place can help to mobilize people towards repairing and rebuilding a community. The question here is whether place attachment can also help motivate people to take anticipatory action in the face of climate risks (e.g., pre-disruption phase, Brown & Perkins 1992) and not just in reaction to impacts or damages that have already occurred (e.g., post-disruption phase, Brown & Perkins 1992). The results of this study – specifically, place-protective actions highlighted by participants – show that strong attachment to place is already catalyzing proactive efforts among some coastal residents. What remains unclear is whether or to what extent place attachment could influence

the decision to leave place. Although participants acknowledge uncertainty about the long-term future of these places due, in part, to their own observations of change over time, they also expressed a dedication to staying in place through their words and actions.

On the other hand, failing to take place attachment into consideration, including differences in what place means to different people, can result in community division, resistance, and/or conflict (Manzo and Perkins 2006; Agyeman et al. 2009; Scannell and Gifford 2010). Resistance and conflict also stem a lack of community engagement or participation in planning and decision-making processes (Agyeman et al. 2009; Marino 2012), and relatedly, from people feeling like their local knowledge and lived experience are being ignored (Burley et al. 2007; Maldonado et al. 2020).The findings of this study, combined with previous research, suggests an opportunity for those involved in adaptation and resilience planning efforts as well as those who are interested in fostering public participation in decision-making processes to learn about and tap into the dynamics of place attachment as a means of facilitating more responsive and inclusive planning. As part of the process of planning for and implementing managed retreat, Agyeman et al. (2009) argue that approaches for fostering and facilitating what they refer to as "place detachment" are needed as the impacts of climate change and other environmental hazards affect more communities. The results of this research suggest that such approaches would require a deep understanding of the emotional bonds that people have with places that are meaningful to them in order to help them process the feelings of anxiety and grief that accompany the act of contemplating the loss of attachment to place and potentially of place itself.

Finally, this Photovoice project was conducted in Maine, a state in the far northeastern region of the U.S., during the COVID-19 pandemic. Much of the process was adapted to allow for virtual engagement to adhere to COVID-19 protocols and to protect the health and safety of the participants as well as the researcher / facilitator. Initially, this posed a challenge to the participatory nature of the methodology. However, the adaptability of the structure of Photovoice and the steps involved proved to be well-suited for pivoting to a mostly virtual and socially distant approach. In particular, taking self-authored photographs that reflect personal perspectives and experiences is an activity that lends itself well to solitude. As well, shifting to the use of a photo booklet before the focus group discussions had unforeseen benefits. The more typical approach in Photovoice projects involves participants engaging with one another's photos

for the first time during in-person focus groups, where they are asked to reflect on the collection of photos and to sort them into themes (see, for example, Radonic & Jacob 2021; Russo et al. 2021; Baldwin & Chandler 2010). Because the focus group discussions for this project were virtual, a different approach was needed. In the end, because the photo booklets were provided 1-2 weeks in advance of the focus groups, participants had additional time and space to review and reflect on the meaning of the full scope of the photographs and narratives. This meant that participants joined the focus groups both prepared and eager to discuss the themes that resonated with them. In fact, several participants had notes prepared about the themes that they saw emerging, with one participant going so far as to put together a spreadsheet of themes and associated photos. Additionally, several participants expressed appreciation for the photo booklet as a kind of gift that they were excited to share with others who loved these places. Finally, the introductory training, one-on-one interviews, and focus group discussions all easily translated onto virtual platforms, which also had the benefit of allowing for participation among those who were not always physically present in place. These are valuable and promising methodological findings of the research, as they suggest that participatory methods like Photovoice can still operate well in situations where in-person engagement is a challenge.

2.7 Limitations

There are several limitations of this study. First, results are only reflective of a small number of participants who self-selected to take part in the study. Although participants reflected the demographics of the broader population of coastal community residents in the town of Wells and, arguably, in Maine, they are not representative of the general population of people living on the coast throughout the U.S.. Second, Photovoice is a qualitative, participatory method that responds to and reflects both the community dynamics and community-researcher dynamics. The researcher's epistemology and reflexivity and facilitative leadership skills shaped this participatory project in ways that might inhibit replicability. Thus, this research is not generalizable beyond the context of small, affluent, mostly seasonal, and predominantly white coastal communities and the results may not be replicable with other communities and/or by other researchers. However, more work across a greater diversity of communities, including those that are more demographically diverse and face different risks, would help shed light on the dynamics of place attachment in places where the long-term viability of continued human habitation is threated by the impacts of climate change.

2.8 Conclusion

The results of this study serve as a reminder that how climate change impacts us and how we respond is not just a technical matter. Rather, it is also a very emotional one. The affective dimensions that emerged in this study – emotions experienced in place, emotional bonds with place, emotional responses to place change, emotions motivating adaptive capacity – help to shed light on what is typically not considered in adaptation planning processes. For example, people who are facing the risk of losing their connection to a place that holds meaning for them experience feelings of grief and anxiety as they process what that disruption means for them. Approaching coastal resilience and climate adaptation work with empathy for what people are experiencing emotionally is therefore critical. Creating space for people to share what makes a place special to them allows for important dynamics to emerge that can help identify planning priorities. As well, the findings make clear that many coastal residents know that dramatic change is underway and that they're already thinking about long-term planning and decision-making. People want to be involved in the planning and decision-making processes that affect the places that they love. Incorporating the knowledge that they have gained through their lived experiences with place also makes adaptation plans more responsive and robust. Regardless of whether managed retreat is pursued as a strategy to respond to sea level rise in Wells now or in the future, the dimensions of place attachment highlighted by the participants in this study can and should inform ongoing coastal resilience and climate adaptation planning to benefit both at-risk places and the people who care about them.

2.9 Acknowledgements

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REFERENCES

Adger, W.N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D.R., Naess, L.O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change?. *Climatic change*, *93*(3-4), pp.335-354.

Adger, W. N., Barnett, J., Brown, K., Marshall, N., & O'Brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, *3*(2), 112-117.

Adie, B. A. (2020). Place attachment and post-disaster decision-making in a second home context: A conceptual framework. *Current Issues in Tourism*, 23(10), 1205-1215.

Agyeman, J., Devine-Wright, P., & Prange, J. (2009). Close to the edge, down by the river? Joining up managed retreat and place attachment in a climate changed world. *Environment and Planning A*, *41*(3), 509-513.

Altman, I., & Low, S. M. (1992). *Place attachment*. Plenum Press. New York.

Baldwin, C., Smith, T., & Jacobson, C. (2017). Love of the land: Social-ecological connectivity of rural landholders. *Journal of Rural Studies*, 51, 37-52.

Bertana, A. (2019). Relocation as an Adaptation to Sea-Level Rise: Valuable Lessons from the Narikoso Village Relocation Project in Fiji. *Case Studies in the Environment*.

Binder, S. B., Baker, C. K., & Barile, J. P. (2015). Rebuild or relocate? Resilience and post-disaster decision-making after Hurricane Sandy. *American journal of community psychology*, *56*(1-2), 180-196.

Binder, S. B., & Greer, A. (2016). The devil is in the details: Linking home buyout policy, practice, and experience after hurricane Sandy. *Politics and Governance*, 4(4), 97-106.

Bronen, R. (2015). Climate-induced community relocations: using integrated social-ecological assessments to foster adaptation and resilience. *Ecology and Society,* 20(3).

Brown, B. B., & Perkins, D. D. (1992). Disruptions in place attachment. In *Place attachment* (pp. 279-304). Springer, Boston, MA.

Burley, D., Jenkins, P., Laska, S., & Davis, T. (2007). Place attachment and environmental change in coastal Louisiana. *Organization & Environment*, *20*(3), 347-366.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, *39*(3), 124-130.

De Sherbinin, A., Levy, M., Adamo, S., MacManus, K., Yetman, G., Mara, V., Razafindrazay, L., Goodrich, B., Srebotnjak, T., Aichele, C., & Pistolesi, L., (2012). Migration and risk: net migration in marginal ecosystems and hazardous areas. *Environmental Research Letters*, 7(4), 045602.

Dupigny-Giroux, L., Mecray, E., Lemcke-Stampone, M., Hodgkins, G., Lentz, E., Mills, K., Lane, E., Miller, R., Hollinger, D., Solecki, W., Wellenius, G., Sheffield, P., MacDonald, A., & Caldwell, C. (2018). Northeast. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II*. U.S. Global Change Research Program, Washington, DC, USA, pp. 669–742.

Devine-Wright, P. (2013). Dynamics of Place Attachment in a Climate Changed World. In *Place Attachment: Advances in Theory, Methods and Applications.* Routledge.

Earth Institute (2019). At What Point Managed Retreat? Resiliency Building in the Coastal Zone. Conference held 19-21 June 2019, at Columbia University, New York, NY. Presentations and video recordings available at http://adaptation.ei.columbia.edu/conference/at-what-point-managed-retreat-conference/. Accessed 21 September 2020.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.

Faulkner, L., Brown, K., & Quinn, T. (2018). Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society*, 23(1).

Fleming, E., J. Payne, W. Sweet, M. Craghan, J. Haines, J.F. Hart, H. Stiller, and A. Sutton-Grier, (2018). Coastal Effects. In *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 322–352.

Hino, M., Field, C. B., & Mach, K. J. (2017). Managed retreat as a response to natural hazard risk. *Nature Climate Change*, 7(5), 364.

IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].

Koslov, L. (2016). The case for retreat. *Public Culture*, 28(2 (79)), 359-387.

Krueger, R. & Casey, M. A. (2009). *Focus groups: A practical guide for applied research*. Sage Publications.

Mach, K. J., Kraan, C. M., Hino, M., Siders, A. R., Johnston, E. M., & Field, C. B. (2019). Managed retreat through voluntary buyouts of flood-prone properties. *Science Advances*, *5*(10), eaax8995.

Maine Climate Council (2021). Sea level rise in Maine: An accelerating problem. https://climatecouncil.maine.gov/sea-level-rise-maine-accelerating-problem. Accessed 9 January 2023.

Maldonado, J., Wang, I. F. C., Eningowuk, F., Iaukea, L., Lascurain, A., Lazrus, H., Naquin, C. A., Naquin, J. R., Nogueras-Vidal, K. M., Peterson, K., Rivera-Collazo, I., Souza, M. K., Stege, M., & Thomas, B. (2021). Addressing the challenges of climate-driven community-led resettlement and site expansion: knowledge sharing, storytelling, healing, and collaborative coalition building. *Journal of environmental studies and sciences*, *11*(3), 294-304.

Manzo, L. C. (2005). For better or worse: Exploring multiple dimensions of place meaning. *Journal of environmental psychology*, 25(1), 67-86.

Manzo, L. C., & Perkins, D. D. (2006). Finding common ground: The importance of place attachment to community participation and planning. *Journal of planning literature*, 20(4), 335-350.

Manzo, L. C. & Devine-Wright, Patrick. (2013). *Place Attachment: Advances in Theory, Methods and Applications*. Routledge.

Marino, E. (2012). The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Global environmental change*, *22*(2), 374-381.

Marino, E. (2018). Adaptation privilege and Voluntary Buyouts: Perspectives on ethnocentrism in sea level rise relocation and retreat policies in the US. *Global environmental change*, 49, 10-13.

Marshall, N. A., Park, S. E., Adger, W. N., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters*, *7*(3), 034022.

Mason, M. (2010, August). Sample size and saturation in PhD studies using qualitative interviews. In *Forum qualitative Sozialforschung/Forum: qualitative social research* (Vol. 11, No. 3).

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. 3rd.

National Oceanographic and Atmospheric Administration (NOAA). (2007). Managed retreat strategies. Website (archived 5 September 2015). Available at https://web.archive.org/web/20150905055350/http://coastalmanagement.noaa.gov/initiatives/shoreline_ppr_retreat.html. Accessed 21 September 2020.

National Research Council (NRC). (2009). *Human Dimensions of Global Environmental Change: Research Pathways for the Next Decade*. Washington, DC: The National Academies Press.

Oppenheimer, M., B.C. Glavovic , J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, and Z. Sebesvari. (2019). Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].

Rajala, K., Sorice, M. G., & Thomas, V. A. (2020). The meaning (s) of place: Identifying the structure of sense of place across a social–ecological landscape. *People and Nature*, 2(3), 718-733.

Rubin, H. J., & Rubin, I. S. (2011). Qualitative interviewing: The art of hearing data. Sage.

Saldaña, J. (2014). Coding and analysis strategies. *The Oxford handbook of qualitative research*, 581-605.

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. *Journal of environmental psychology*, 30(1), 1-10.

Science Friday. (2019). As Seas Rise And Rivers Flood, Communities Look For A Way Out. Radio program, aired 18 October 18 2019. Available at https://www.sciencefriday.com/segments/degrees-of-change-migration/. Accessed 21 September 2020.

Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic change*, *152*(2), 239-257.

Siders, A. R., Hino, M., & Mach, K. J. (2019). The case for strategic and managed climate retreat. *Science*, 365(6455), 761-763.

Southern Maine Planning and Development Commission (SMPDC). (2022). Economic Resilience Assessment and Plan for Coastal York County. https://smpdc.org/vertical/Sites/%7B14E8B741-214C-42E2-BE74-5AA9EE0A3EFD%7D/uploads/EDA_Project_FINAL_Report_SMPDC_Combined_for_Website_042822.pdf. Accessed 9 January 2023.

Susskind, L., Rumore, D., Hulet, C., & Field, P. (2015). *Managing climate risks in coastal communities: Strategies for engagement, readiness and adaptation*. Anthem Press.

Tournois, L., & Rollero, C. (2020). "Should I stay or should I go?" Exploring the influence of individual factors on attachment, identity and commitment in a post-socialist city. *Cities*, 102, 102740.

Tuan, Y. F. (1974). *Topophilia: A study of Environment Perception Attitudes and Values.* Prentice Hall International. New Jersey.

US Census Bureau (2020). QuickFacts for Wells Town, York County, Maine. https://www.census.gov/quickfacts/fact/table/wellstownyorkcountymaine,US/PST045221. Accessed 9 January 2023.

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health education & behavior*, 24(3), 369-387.

CHAPTER 3: "THIS PLACE ISN'T FOREVER": PHOTOVOICE AS A TOOL FOR UNDERSTANDING AND FACILITATING PLACE DETACHMENT IN COASTAL COMMUNITIES

3.1 Introduction

Sea level rise, coastal erosion, increased flooding, and more frequent or severe storms pose an existential threat to the low lying coastal areas that are home to approximately 11% of the world's population (De Sherbinin et al. 2012). A variety of response strategies exist to reduce coastal hazard risks for the communities who live, work, and recreate in these areas (Oppenheimer et al. 2019; see Figure 13). One example is protection, or keeping water out, which may include building hard infrastructure like sea walls or breakwaters. Protection strategies can also take the form of Nature-Based Solutions that combine protection with ecosystem management and may include the conservation or restoration of wetlands and coral reefs, which can help to absorb the impact of flood waters and storm surge. Another approach is accommodation, or living with water, and may include strategies like elevating homes and infrastructure or creating setback requirements to accommodate rising sea levels. There is also retreat, or getting out of water's way, which involves the moving of people, property, and infrastructure away from hazardous areas on the coast through migration, displacement, and/or relocation.

When protection and accommodation fall short, retreat may become the most viable or only option left to reduce physical risk for coastal communities. Even if pursued as a last resort, retreat need not be viewed as giving up: when carried out in a voluntary way that respects the human rights and self-determination of those impacted, it is a strategic form of adaptation that responds to sea level rise in order to protect human lives (Mach & Siders 2021; Koslov 2016; McNamara et al. 2016; Bronen 2011). Even so, adaptation through relocation away from the coast is bound to result in people experiencing loss. In the context of climate change, loss can be described as the point at which response strategies can no longer protect the things that people care about, value, and find meaning in beyond their own life (Tschakert et al 2017). Losses may occur across social and ecological scales, including financial losses associated with damage or destruction to property and the loss of habitat due to erosion or inundation (Oppenheimer et al.

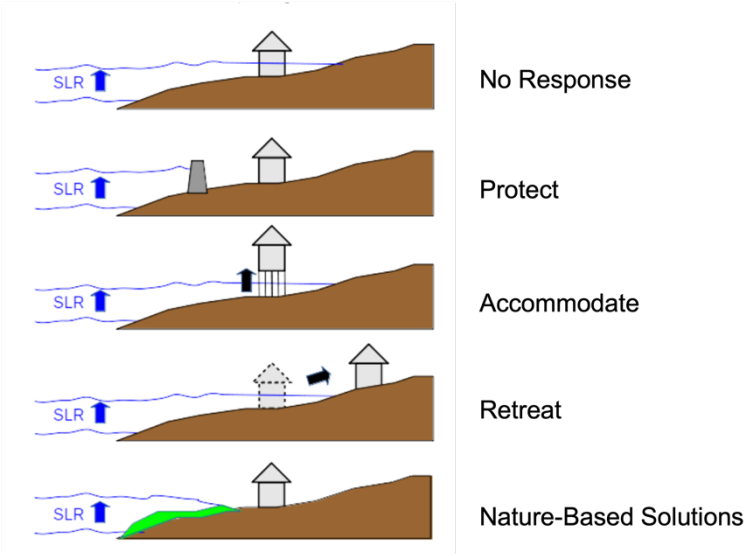

Figure 13: Sea level rise response strategies (Adapted from Oppenheimer et al. 2019)

2019; There are also other types of non-market based and intangible losses, such as family history, cultural practices, place-based knowledge, and self or group identity (Maldonado et al. 2021; McNamara et al. 2016; Barnett et al. 2016; Adger et al. 2013; Marino 2012; Agyeman et al. 2009; Burley et al. 2007). These dynamics are often manifested through place attachment, which describes the extent to which people feel connected to a place that is meaningful to them (Manzo & Devine-Wright 2013; Adger et al. 2013; Marshall et al. 2012; Scannell & Gifford 2010).

In discussing the importance of place attachment within a managed retreat context, Agyeman et al. (2009) refer to a concept called 'place detachment,' which they describe as a process "whereby individuals and groups anticipate and negotiate the negative future consequences of remaining in a place by intentionally loosening existing attachments and forming new ones elsewhere" (pg. 512). Tschakert et al. (2017) build on the concept of place detachment by linking it with a personal sense of agency that allows for people to engage with loss in an anticipatory way. Even before people have to make the difficult decision to leave a place due to the impacts of climate change, they may feel a sense of loss and distress while still in place because they perceive or anticipate place change, a phenomenon that is referred to as solastalgia, or the feeling of homesickness while still in one's home (Albrecht 2005). Barnett et al. (2016) identified three dimensions of knowledge that are needed to better understand the science of loss as it relates to climate change: what people value, drivers of change, and

engagement with loss. Of course, not everyone who retreats has the luxury of anticipating detachment or loss if they are, for example, displaced because of a disaster. But for those individuals or communities who are proactively considering, planning for, or pursuing retreat, preemptively engaging with loss in an intentional way could help to facilitate the painful albeit necessary process of letting go of a cherished place in a way that provides time and space to navigate through the emotional responses that arise as a result of doing so.

Incorporating these affective dimensions of loss and detachment in retreat policy, planning, and practice is crucial but remains difficult to do because they are often overlooked or unaccounted for using standard economic, geospatial, and other highly technical approaches to adaptation assessment, design, and implementation (McNamara et al. 2020; Tschakert et al. 2020; Bertana 2019; Siders 2019). As Tschakert et al. (2017) explain, "Loss is often given meaning through lived, embodied, and place-based experiences, and so is more felt than tangible" (pg. 1). Participatory research and engagement approaches that seek to collaborate with affected communities in the co-production of knowledge are well-suited to capturing these dynamics (Schumann et al. 2019; Barnett et al. 2016). As well, creative methods that incorporate artistic expressions of the lived experience with climate change impacts and loss have been shown to support the ability of people to process the grief they feel when considering what is being or what will be lost (Tschakert et al. 2017).

Currently, the process of place detachment in a managed retreat context is not well understood. Research is needed to better understand what the detachment process might entail and how it could be supported by policy interventions, planning processes, and engagement practices (Agyeman et al. 2009). An emerging area of study related to climate change impacts referred to as the "science of loss" suggests that doing so requires exploring the place-based values that people hold, understanding lived experiences with climate change, and gaining insight into how people engage with and process loss (Tschakert et al. 2017; Barnett et al. 2016). This paper presents a hypothetical approach for facilitating place detachment through the use of a creative, participatory methodology called Photovoice. It is theoretically grounded in the theory and practice of participatory research methodologies and draws on empirical evidence from a Photovoice project conducted with community members in a coastal area where hazards are being amplified by the impacts of climate change, creating a situation where retreat may have to be pursued in the future.

3.2 Methodological Underpinnings and Literature Review

Photovoice is a qualitative, participatory research method that was first introduced in the 1990's by two public health researchers, Caroline Wang and Mary Ann Burris. According to Wang and Burris (1997), the primary goals of Photovoice are recording and reflecting on community strengths and concerns through photographs taken by participants; promoting critical dialogue and knowledge sharing about issues through group discussions about the photographs; and using the photographs to engage policy makers in an effort to effect change (Wang & Burris 1997). Photovoice is "a process by which people can identify, represent, and enhance their community through a specific photographic technique. It entrusts cameras to the hands of people to enable them to act as recorders, and potential catalysts for change, in their own communities" (Wang & Burris, pg. 369). Photovoice builds off of theories and practices related to education for critical consciousness, feminist theory, and documentary photography (Wang & Burris 1997).

Since its inception, photography has served as a method of documentation, helping to shed light on dimensions of life and social welfare that were previously unseen (Szto 2008). Well known examples of impactful documentary photography include the living conditions in blighted and decaying urban centers captured by Jacob Riis, Dorothea Lange's images of rural poverty during the Great Depression, the conditions faced by child laborers detailed by Lewis Hine, and many war photographers documenting the atrocities and aftermath of the Hiroshima nuclear bombing and the Vietnam War. Academic disciplines including anthropology, sociology, and journalism, have long used photography as a form of visual data to help record social and cultural information (Schuman et al. 2019; Wang & Burris 1997). Within this context, photographs have traditionally been taken by people who are outsiders to the circumstances, conditions, or phenomenon being documented and not by the people who are actually experiencing them (Schuman et al. 2019; Wang & Burris 1997). This "gaze" has the effect of conveying what the outsider deems as most important or salient, which does not necessarily align with that of the subject(s). However, with the advent of more readily accessible forms of photography (e.g., point and shoot cameras, smart phones), the medium has become much more democratized. Along with this progress, the practice of using photography as visual data has also changed, shifting away from an outsiders perspective and towards what Schumann et al. (2019) refer to as "reflexive photography by insiders" (pg. 275). This insider's perspective is the foundation of Photovoice methodology.

Photovoice is a process that entails multiple points of engagement. The core components involve 1) participants taking photographs over a set period of time in response to a specific inquiry prompt and narrating the images through written or oral means, 2) a facilitated group discussion among all participants where they reflect on one another's images and identify themes or important takeaways, and 3) sharing the findings with people in power. The framework for the process described by Wang and Burris (1997) involves the follow steps: a) designing the project with community collaborators, including people who are in a position to help effect change, and developing a prompt or prompts for participants to respond to; b) identifying project facilitators, who can be internal or external to the participating community, c) identifying and recruiting participants who have relevant lived experience; d) training participants on the purpose of the project, camera usage, and ethics; e) participating taking of photographs; 6) facilitating group discussions among participants to engage in dialogue about the full collection of photographs; f) participants selecting photographs to include in the analysis, driven by which images were most significant to them; g) participants narrating the stories behind the photographs to provide context; h) conducting participatory analysis with the group of participants to identify issues, theme, or theories; i) reaching policy makers or other decision-makers with the results with the goal of catalyzing action or change. Importantly, Wang and Burris (1997) emphasize the adaptability of the Photovoice methodology, with regard to the focus areas, the objectives, the participants, and the structure of how and when the steps are implemented.

One of the limitations that Wang and Burris (1997) call attention to is the potential for participants to self-censor due to the political nature of documentary photography and discussing community concerns. One option that could help to address this limitation is by including one-on-one interviews with participants at some point during the Photovoice process. Although they are not guaranteed to overcome self-censorship, one-on-one interviews may provide time and space for people to express opinions they might be more reluctant to share with, for example, other participants or decision-makers in photographs and group discussions. While they were not suggested in the process articulated by Wang and Burris (1997), there are several examples of one-on-one interviews being included in Photovoice project for the purposes of exploring participant's photographs and experiences more in depth (see, for example, Radonic & Jacob 2021; Cai 2015; Baldwin & Ross 2012; Nykiforuk et al. 2016).

Because it is a process that involves multiple points of data collection, Photovoice has the potential to illuminate local knowledge and lived experience in more nuanced, in-depth ways than other stand-alone qualitative or quantitative methods (Schumann et al. 2019; Nowell et al. 2006). One way that Photovoice does this is by using the photographs taken by participants as a kind of boundary object throughout the data collection process. Boundary objects are material entities that help to translate meaning across cultural boundaries and viewpoints, thereby creating shared knowledge and understanding (Fox 2011; Star & Griesemer 1989). Schumann et al. (2019) argue that the photographs serve as "visual prompts that move [participants] beyond describing a setting and into a discussion of meaning and feeling in an environment" (pg. 274). For researchers, the photographs provide a window into participant's internal realities and viewpoints in ways that other methods of data collection could miss (Nowell et al. 2006). For participants, the process of taking and narrating photographs creates space for reflection in advance of one-on-one interviews and focus group discussions, fostering more in-depth inquiry and resulting in richer information (Schumann et al. 2019; Nowell et al. 2006).

Wang and Burris (1997) situate the Photovoice method squarely within the framework of participatory research. As an approach that emphasizes doing research *with*, not *on*, people, participatory research seeks to address practical problems, incorporates many ways of knowing, and is emergent in nature, responding to the context and needs of participants (Greenwood & Levin 2006; Heron & Reason 2006; Reason & Bradbury 2008). Participatory research is grounded in the everyday, lived experiences of people (Reason & Bradbury 2008) and stands apart from other modes of inquiry in that it is conducted in the present but is focused on the future (Chandler & Torbert 2003). Reason and Bradbury (2001) stress the importance of grounding participatory research not just in a participatory methodological framework but a "participatory worldview." A participatory worldview is characterized as having an extended epistemology, which posits that there are many ways of knowing (Heron & Reason 2006). Rather than viewing academic forms of knowledge (e.g., produced through theory and empirical research) as the only or most valid form of knowledge, participatory research embraces four interdependent types of knowledge:

- Experiential knowing emerges from direct experience with a person, place or thing
- Presentational knowing expresses experiential knowing through creative forms of expression

- Propositional knowing conceptualizes experiential and presentational knowing and articulates them through written ideas and theories
- Practical knowing synthesizes experiential, presentational, and propositional knowing and applies the resulting knowledge through action (Heron & Reason 2006)

Validity in participatory research is strengthened if there is compatibility across the four ways of knowing, when "our knowing is grounded in our experience, expressed through our stories and images, understood through theories which make sense to us, and expressed in worthwhile action in our lives" (Heron and Reason 2006, pg. 183-4). Participatory researchers also recognize the importance of practicing while also differentiating between different scales of inquiry, namely first person (individual), second person (between people), and third person (across a community or communities) (Greenwood & Levin 2007). These different scales of inquiry serve as opportunities for critical self-reflection and reflexivity (Hynes 2013; Chiu 2006).

Photovoice exemplifies the four ways of knowing by asking participants to consider their experience (experiential), to capture and share it through photography (presentational), to participate in the process of analysis thereby helping to identify themes and concepts (propositional), and to share the outcomes of these process with the broader community and decision-makers to effect change (practical knowing). These different ways of knowing operate at different scales of inquiry, which are also manifested through the Photovoice process in the following ways: when participants are asked to consider and take photographs in response to the research prompt based on their own lived experience (first person), during one-on-one conversations or interviews between the participants and the researcher/facilitator that delve deeper into the meaning of the photographs (second person), and through the group discussions between participants as they reflect on primary themes or what is most important across their photographs, as well as in the public or targeted displays of photographs with the policy makers (third person).

Community-engaged scholar-practitioners from a variety of different disciplinary backgrounds have used Photovoice as a methodology for exploring local knowledge, lived experience, and community perceptions, including in anthropology (Radonic & Jacob 2021), public health (Nykiforuk et al. 2016), community psychology (Nowell at al. 2006), natural resource management (Baldwin & Ross 2012), and youth studies (Wilson et al. 2007). Photovoice has also been used in a growing number of studies focused on climate change (Cai

2015; Baldwin & Chandler 2010), emergency management (Russo et al. 2021), and disaster studies (Ratnam et al. 2016). Schumann et al. (2019) argue that Photovoice is a promising yet underutilized methodological tool for research related to natural hazards and disasters, including across the four phases of emergency management practice (preparedness, response, recovery, and mitigation/risk reduction). The authors explain that recent shifts in the policy and practice of emergency management to better engage with affected populations and stakeholders, such as the US Federal Emergency Management Agency's (FEMA) "whole community" framework (FEMA 2016), have created opportunities for "community informed, culturally appropriate, and inclusive approaches" like Photovoice to be used in exploring the social dimensions of natural hazards and disasters. To date, however, Photovoice has yet to be applied in as an approach for exploring the social dimensions of climate-induced retreat.

3.3 Project Background and Study Area Context

This project was undertaken as part of a collaboration between a researcher and community partners with the Coastal Training Program (CTP) at the Wells National Estuarine Research Reserve, located in southern coastal Maine. The CTP associates were interested in conducting research to better understand the challenges of developing adaptation strategies and relocation polices, with an emphasis on doing so through methods that engaged communities in

Figure 14: **Coastline of Wells, ME during a King Tide event, November 2021.** Image credit: Mark Wiley, Appledore Aerial Imaging

dialogue. Working together over the period of several month, the researcher and CTP associates designed a Photovoice study to explore place attachment among residents in two coastal neighborhoods in the town of Wells. Place attachment is one of many social dimensions of climate change and it is particularly relevant in areas like Wells where place is changing over time and the communities who are attached to place are making decisions about how to adapt to those changes.

The town is located on the Atlantic Ocean and features seven miles of coastline with long, flat, sandy beaches and an extensive network of estuaries and salt marshes. The coastal neighborhoods in town are highly developed and densely populated by seasonal and year-round homes, varying in age and size (see Figure 14, for example). Given its proximity to the ocean,

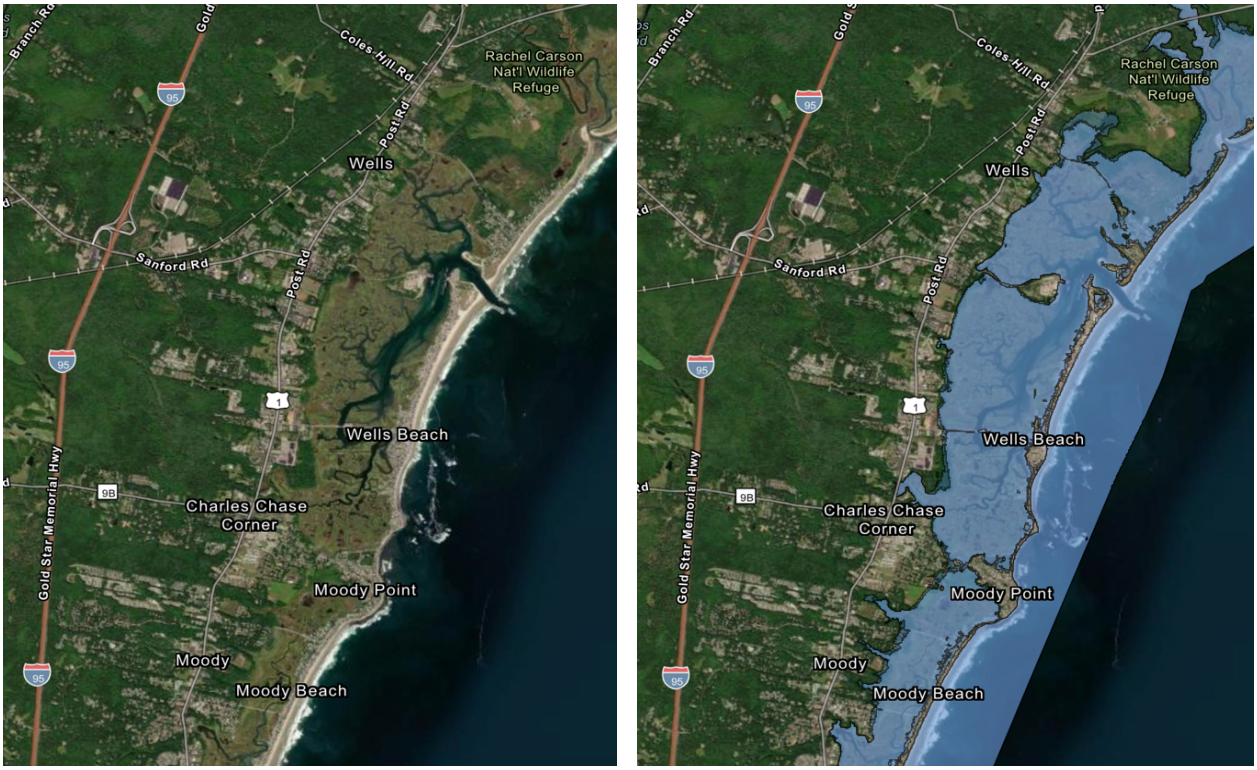

Figure 15: **Coastline of Wells ME (right) with 1.6 / 3.9 feet sea level rise projection (left).** Images captured from SMPDC's Regional Coastal Vulnerability and Exposure Mapper

Wells is experiencing the effects of sea level rise, with the coastal neighborhoods on the frontlines of coastal erosion, increased flooding, and stronger, more frequent storm events. State climate projections indicate that Maine can expect between 1.5 and 3 feet of sea level rise by

2050 and between 4 and nearly 9 feet by 2100 (Maine Climate Council 2021). At just one foot of sea level rise, nuisance or sunny day flooding becomes 15x more frequent, while at 1.5 feet of sea level rise, approximately 40% of Maine's dry beach area is lost (Maine Climate Council 2021). The physical characteristics of Wells' coastline – both the natural and built environment – make it highly vulnerable to these impacts (see Figure 15).

3.4 Sample Population

This study used Photovoice as a method for exploring the dynamics of place attachment in coastal communities where long-term change to place may result in the need for retreat in the future. This Photovoice project was conducted with participants who reside in coastal neighborhoods in the town of Wells, Maine. This research focused on exploring the knowledge, perceptions, experiences, and aspirations of people who have relationships with place that extend over time in coastal areas that are experiencing environmental change; thus, recruitment of participants followed a purposive sampling strategy (Etikan 2015) and targeted people who had lived in the coastal community, either seasonally or year-round, for at least two years. Recruitment began by working through leaders in community-based organizations (e.g., a land trust and an advocacy group), who provided email contact information and connection to potential participants. Recruitment messages were also shared via active neighborhood groups on Facebook.

Initially, the project focused on one neighborhood (Drakes Island, referred to as Community 1), however, when recruitment and retention of the targeted number of participants (n=10-12) proved challenging with that community, a second neighborhood (Moody Beach, referred to as Community 2) featuring similar social and ecological characteristics was added to the study. Recruitment proceeded in the same way with Community 2, two months after data collection in Community 1 was completed. A total of 26 people responded to the recruitment emails or social media posts to indicate interest (n=13 in both neighborhoods), of which 20 people (n=9 in Community 1 and n=11 in Community 2) participated in virtual introductory trainings, discussed below. Following the trainings, a total of 12 participants (n=5 in Community 1 and n=7 in Community 2) completed the full Photovoice process detailed below, while the remaining 8 either no longer responded, indicated that they did not have the time to participate, or would not be the in the area during the time of the study. As an incentive, participants were

each provided with a $75 stipend after completion of all stages of data collection (e.g., photos with narrative statements, one-on-one interviews, and focus group discussions).

Table 5: Description of Sample Population

Neighborhood	# of Participants	Year-Round (YR) / Seasonal (S)	Age Range	Male (M) / Female (F)	Project Time Period
Drakes Island (Community 1)	N=5	2 YR / 3 S	23-78 Years	4 M / 1 F	June – August 2021
Moody Beach (Community 2)	N=7	3 YR / 4 S	55-74 Years	3 M / 4 F	October – December 2021

The 12 participants who completed the Photovoice process (see Table 5 for details) were all property owners (individually or with family members) who either lived in the area year-round or seasonally. For the seasonal residents, these places are second homes during part of the year, typically late spring through early fall. The age range of participants spanned from 23 to 78, with the majority of participants being of retirement age. The length of time connected to place ranged from people who had been spending time in these places since they were born to those who had resided in place for approximately the last 10 years. The Photovoice process in both communities spanned the period of three months; however, the process in community 1 took place from June to August and, for community 2, it took place from October to December. This is worth noting because there are seasonal differences (both social and environmental) between these time periods that potentially shaped the types of images that participants submitted.

3.5 Data Collection

The Photovoice approach taken by this project involved the following steps: After recruiting participants, two introductory training sessions (one for each community) were held to provide information on the purpose of the project and the steps involved. Participants were provided with a protocol to guide the photography process, including photo prompts, the number of photos to take, suggestions for writing narrative statements to accompany photos, ethical considerations about photography, and how to submit their materials when completed. There was an option to

borrow a digital camera for the project, but all participants chose to take photos with their cell phones. Participants were instructed to take as many photographs as they'd like over the period of two weeks to one month and to choose between 5 – 15 photographs to submit. Participants were asked to take photographs that responded to the question, "When it comes to [this place], what do you care about most?" and to submit at least one photograph that depicted each of the following:

- A physical location or natural feature in [this place] that is special to you
- An activity that you enjoy doing in [this place], either by yourself or with others
- Something that recalls a memory or experience in [this place]
- Anything that you might be concerned about in [this place]

The guiding question, along with the prompts, were designed to be broad enough to capture the different dimensions of place attachment (e.g., people, process, place) as well as any types of issues or challenges that people experience in their relationship with place. Climate change was not mentioned in either the guiding question or the prompts; this choice was made intentionally in order to see if participants would identify climate change as an issue that they had experience with or were concerned about.

Once participants submitted their photographs and narrative statements via email, text, or upload, semi-structured, in-depth interviews were conducted with each individual participant. Interviews focused on gaining a deeper understanding of the dynamics of each participant's attachment to place, including their perspective on the past, present, and future of place (see Appendix A for interview protocol). Semi-structured interviews allow for exploring pre-determined but open-ended questions from the interviewee's perspective, which is informed by their personal experiences and values (Rubin & Rubin 2011). Prior to the start of the interviews, participants were asked via email to choose between 3 and 5 images from those they submitted that were most important to them or that were the strongest representation of their connection to place. These photographs were used to initiate the conversation and served as visual reference points for participants as they expanded on their experiences in and with place. If time allowed, additional photos were reviewed and discussed. Interviews were conducted virtually via Zoom or, when conditions allowed, in person at the interviewee's home or at the Wells National Estuarine Research Reserve. Interviews were scheduled for an hour but lasted between 45 minutes and 2.5 hours. Interviews were audio recorded and transcribed into text files.

Following completion of the one-on-one interviews, participants received physical copies of 8.5x11 inch booklets that contained all of the photographs and narrative statements from their respective communities, de-identified and arranged randomly. Participants were requested to spend half an hour reviewing the booklet prior to the group discussions, to jot down their reflections and make note of any common themes, similar stories, and/or shared concerns. Approximately 1-2 weeks after receiving the booklets, participants took part in a facilitated focus group discussion (one per community) where they reflected on each other's photos and engaged in dialogue about shared cares and concerns related to place. This paper focus on the analysis of the interviews; focus group methods and analysis are detailed in Chapter 2.

Finally, selected photographs and narratives statements, grouped by key themes that emerged during focus group discussions and through initial analysis of the data, were displayed as an exhibit in a gallery space at the Wells National Estuarine Research Reserve for the period of five weeks during the summer of 2022. A public opening event, attended by approximately 50 people, was held to foster broader community engagement with the project. The exhibit was also displayed as part of a regional coastal resilience planning meeting attended by approximately 25 decision makers from southern Maine, which prompted reflection on the social dimensions of climate change impacts and responses.

3.6 Data Analysis

Interview transcripts were coded using the same codebook that was applied to the photographs, narrative statements, and focus groups transcripts (described in Chapter 2; see Appendix G). Interviews were coded using a deductive approach that focused on coding categories related to affective dimensions, lived experience with environmental change over time, adaptive strategies, and perceptions about the future. These areas of interest correspond with a theoretical framework laid out by Barnett et al. (2016), which posits that there are three dimensions of knowledge needed to better understand the science of loss as it relates to climate change: what people value, drivers of change, and engagement with loss. Coded text was extracted from the data and placed into a data display table organized by participant (Rubin & Rubin 2012). Memos and summary statements were used to interpret the data (Rubin & Rubin 2011; Miles et al. 2014). Commonly used validity procedures for qualitative, participatory research were used to ensure quality and rigor, including researcher reflexivity, triangulation (e.g., between photographs / narratives, one-on-one interviews, and focus group discussions),

prolonged engagement in the field, and peer debriefing (Cresswell & Cresswell 2018). From this analysis emerged three primary themes – *1) lived experience with coastal hazards, past and present; 2) processing the potential for impacts and losses; and 3) perceptions of risk, adaptation strategies, and rebuilding* – detailed below.

3.7 Results

3.7.1 Lived Experience with Coastal Hazards, Past and Present

All participants in the study expressed an understanding that change over time was occurring in place and they all also described an awareness of the likelihood that the coast would continue to change in the future. In addition to higher high tides, a specific example of change that came up repeatedly across both communities was the increased frequency and severity of storms. Several participants have resided in the area long enough that they had lived experience with the impacts of and responses to storms in the past that have caused damage and destruction in the area, such as the Blizzard of 1978, the Patriot's Day Storm in 2007, and Hurricane Sandy in 2012. A few participants recounted having to evacuate themselves and family members for these storms and what it was like for them to come back afterwards. Referring to Hurricane Sandy, one participant explained,

> I got a knock on the door by the chief of police or fire, saying, 'You have to evacuate.' My husband was in a wheelchair…and we had to go relocate for three days up in Yarmouth. When we got back, the entire porch, the windows, everything, *everything* outside was covered in sand. I could barely open my storm door.

The memories of these extreme events came up regularly as reference points for discussing the types of coastal hazards and climate impacts they are currently observing.

Much of the coast in Wells lies within the Federal Emergency Management Agency (FEMA) 100-year flood zone, which participants are very aware of because of the associated requirements for homeowners to carry flood insurance. In this context, it is not surprising that several participants referred to 100-year storms as a reference point for describing change. For example,

> How we looked at it in the past, is going to be different than how we look at the future. How do we prepare for that? And how do we do the tough thing of saying, 'Well, you know, this land that you're living on, the chances of it flooding in the

next five years are now really, really big.' As opposed to in the past, it would have been the 100-year flood. Now, it's the five-year flood.

And,

> One of the more recent storms, we were kind of walking around, you know, during the high tide, like everyone else was, and they were saying they hadn't seen this, like since 1970-something. And it's like, well, they call this the 100-year storm or 100-year flood or whatever. And they said, 'Yeah, this is the third time we've seen this so it's more than 100 years.'

Figure 16: Participant Photo 8 - *"The weather that day was clear and sunny, mid-50's, winds out of the west at 5 MPH. By all accounts, a rather lovely day in November. A King Tide occurred around noon reaching heights of +11.4 feet. This aerial footage shows the impact of the sea, ON A GOOD DAY. Imagine adding to the mix rising sea levels or increasingly severe storms? These potential compounding effects could be even more devasting."*

Most participants conveyed a sense of uncertainty and/or concern about how such changes could impact their relationship with place. Levels of concern varied, with some participants suggesting a belief that there was little that they or anyone else could do about it while others were looking for or actively undertaking adaptive strategies in attempt to protect place. For some, a high level of concern was accompanied by a sense of powerlessness or

frustration because they wanted to take action but didn't feel like they had the knowledge, resources, or support to do so. As one participant explained, "This also shows that we've sort of been left on our own, because we don't know what we can do."

3.7.2 Processing the Potential For Impacts and Losses

Many participants expressed that consistency was one of the dynamics of place that made it meaningful to them, namely that they could depend on place to meet their social, psychological, and emotional needs. As the coast changes, that consistency is starting to erode. The terms used by participants to describe how or what they feel in the face of change and uncertainty, including "nervous," "unnerving," "alarming," "stress," "anxiety," "sad," "depressing," "disheartening," and "grief," depict a range of affective responses. For some participants, these feelings reflect a perception that place itself is fleeting or impermanent. As one participant explained, "It was heartbreaking, over the winter when there were storms, to watch the waves come over the dune…It's scary, because you're like, this place isn't forever…it's undeniable that there is change."

There is, of course, a natural tension between attachment to and impermanence of place. More than half of the participants expressed a kind of internal conflict they are experiencing, where they recognize that the changes they are observing have the potential to negatively impact place and their relationship with it now and into the future, yet several participants expressed a specific commitment to staying in place for as long as possible. Some openly grapple with the risk of staying, as one participant explained, "Is it stupid and selfish to hold on to this, rather than, say, okay, we've had a good run of, you know, 60 years or so. And maybe cash in on it. But I'm selfishly holding on to it and hoping I can still drive onto the island for the rest of my life."

For many, the commitment to place is tied to family legacy and a desire to pass down what is, for many, a multiple and/or inter-generational relationship with place. For a few, place is what connects them past generations and family members who are longer present, which evokes a sense of responsibility to maintain the connection to a place that was meaningful to their loved ones. The possibility of disruption for future generations causes some to worry. While considering the ability of their children and grandchildren to continue living in a home that has been in their family for many generations, one participant stated,

I'm concerned about, you know, will the cottage be able to be the same in 20 years? Or will the waves breaking over the seawall…water coming over…will they have to rebuild it or build a new house? Because the water levels have increased so much? But I don't honestly spend a lot of time thinking about this, because then it will give me anxiety. It will make me anxious.

Figure 17: Participant Photo 9 - *"According to my grandparents, Drakes Island is a completely different place than the sleepy beach community of 50 years ago. The houses are bigger, the roads are busier, construction never ends, and the people are less familiar. The shape of the beach has changed since construction on Wells Harbor and the jetties began in the 1960s, with sand shifting dramatically from where it once was. Storms are more severe and weather is less predictable, and it seems like the seawalls will need to be fortified in coming decades. I sometimes worry about the future of my relationship to Drakes Island as it continues to change, but it's reassuring that even as things change around them, my family remains a constant."*

Several participants expressed an understanding that younger generations would decide for themselves what was best for them when and if the time came to make difficult decisions.

Notably, though, the youngest participants expressed the most doubt about their ability to maintain connection to place in the long run. As one explained,

> So I can imagine that, you know, as climate continues to change, a lot of that will get washed away or damaged beyond repair, or the construction that they're doing to fortify those giant houses is going to have some impacts on the structural integrity of the island, of the seawall that it will either be so damaged it's unrecognizable, or will be so fortified by the insane amount of money that people are going to bring in that it will also be unrecognizable…I think either way, the ocean will claim it or super, super rich people will build up the island so much that it's different…I don't really see myself having a future there.

3.7.3 Perceptions of Risk, Adaptive Strategies, and Rebuilding

Typically, oceanfront properties may be the first to come to mind when considering who is most likely at risk from the impacts of climate change. A few participants expressed feelings of pleasure or relief that they did not own oceanfront property because of the risk. However, a majority of participants acknowledged, some with surprise, that the areas facing the most risk of flooding from higher high tides and stronger storms were not those located on the oceanfront but instead on the marsh side. In these areas, the houses on the oceanfront tend to be at a higher elevation because they are built on sand dunes and they also have seawalls, whereas the houses along the marsh are closer to sea level and typically lack armoring (although many are elevated above ground). As one participant described their experience,

> At the end of the day, it's like, If sea levels rise, it doesn't matter what you do, because everything now comes from back behind the marsh. So that was the thing this winter…when the marsh flooded and the water came up under our house. You know, we're up on stilts, so it's fine. But, yeah, it's water on all sides.

While they understand that the water surrounding them has been getting higher based on their own local observations, knowledge, and experience, only a couple of participants referred specifically to engaging with scientific projections about future sea level rise and the impacts it could have locally. For example, one participant described exploring a website about sea level rise created by the National Oceanographic and Atmospheric Administration (NOAA), explaining that, "depending on how many inches the sea rises…it doesn't take a whole lot of sea rise for Drake's Island to have three or four houses left on it." However, several participants

expressed interest in learning about the availability of downscaled sea level rise projections and other local data, including through participation in local planning processes. One participant who had explored sea level rise maps produced as part of the town's comprehensive planning process had some stark realizations mixed with conflicted feelings about the future of their home:

> When I see the town plan, and it says…here's what it's gonna look like with, you know, a foot and a half of sea rise in 50 years or here's what it's going to be if it's five feet or something like that. Then I'm going, 'That makes me waterfront, I need to start saving for the seawall, like right now.' But, you know, but having said that, it's like, I don't want it to go. It's too special.

With the effects of sea level rise and stronger or more frequent storms are already impacting place, participants understand that adaptive strategies are needed. There is a perception among participants that armoring approaches like sea walls and rip rap are only temporary solutions to keeping water out. The skepticism about the long-term viability of these approaches is, at least partially, based on the lived experience of witnessing sea walls in the area fail in the past. As one participant described, "It's amazing. That storm is the one that came through Moody Beach, by the public way down there, and over the seawall…right through a house. The house is now on stilts…it was uninhabitable." Doubt about the effectiveness of armoring strategies is also based on an understanding of the impacts that hard infrastructure like sea walls can have on place, in terms of the natural environment as well as the character of the community.

Most participants mentioned familiarity with other adaptive strategies, including road culverts, building setbacks, and elevated homes, the latter two of which are current zoning requirements for newly built or retrofitted homes in the area. Although a couple of the participants mentioned that their homes were newer and thus already elevated, most others who discussed this tactic explained that it was not an option for them because it was either too cost prohibitive and/or it could not be done as a retrofit for their existing home due to their foundations. Elevated homes were discussed frequently as a wise approach to dealing with sea level rise, but they are also seen as a potential threat to community character because they are perceived as changing the look and feel of place. One participant explained,

> They're now building with the thought that ocean is going to be surging on a regular basis. And if you want to protect that home, you need to have these steel girders and elevate the actual building. Never would have thought about, you

> know, 50 years ago. And it does create a different feel to the place because you've got the old-time cottages. And then you get these brand new places, it's different architecture, it's a different feel to it.

Regardless of adaptation efforts, though, coastal hazards are ever and increasingly present in these places. Most participants expressed some kind of vision of place in the future that is dramatically different from the present, where the inhabitability of these areas may be difficult or impossible. As one participant described their thoughts about the future of their family home, "If they sign the house over, I think the amount of work that would need to be done to be able to bring it up to the standards where I would feel comfortable even imagining a future where I could leave it to my kids, it would be, well, you'd need floats for it." Participants across the neighborhoods used a common phrase – "washed away" – to describe the inherent risk of homes, roads, and other infrastructure being located so close to the ocean, especially as climate impacts increase. When discussing the potential for homes (theirs or others) to be damaged or destroyed during storms or from repetitive flooding, several participants articulated a conviction that public taxpayers and the government should not be responsible for paying for private property owners to rebuild in these risk-prone areas. While talking about potential rebuilding efforts, one participant explained, "Things evolve and you just have to learn to adapt. But how much of that responsibility is on the oceanfront owner? And how much of it is supposed to be the community who comes in and bails them out?"

Although participants from both neighborhoods expressed this sentiment, it was discussed more specifically in one of the neighborhoods where private ownership of the beach to the mean low tide mark by oceanfront homeowners is a historically divisive issue in the community. Here, the sentiment is strong that those who argue for continuation of the law that prevents public access should not expect public funding to support private rebuilding efforts. As articulated by one participant (whose family home, it is worth noting, is located on the oceanfront),

> Eventually, nature will probably be the final arbiter. Because if there is another big storm, and the people who are right on the beach, if their properties get damaged, or the beach gets eroded, or whatever, their natural inclination will be to say, oh, US state or federal government help us out? Well, that is your private

property…that is what you have asserted all these years. So guess what happens with private property?

As simply put by another participant, though, it is not just about who should bear the costs of rebuilding and recovery: "If you just keep building, especially on severely exposed land…it's a recipe for long-term disaster."

Figure 18: Participant Photo 10 - *"About a hundred yards from the "Drakes Island" marker on the Barrier Beach trail, this sign is a sobering reminder that future generations of Drakes Island residents will be displaced and lose their homes if sea levels continue to rise to their projected levels."*

3.8 Discussion

This study investigated the lived of experiences, perceptions, and concerns of people who have long-term attachment to coastal places that are being impacted by climate change. The communities in these areas are not yet at the point of seriously considering or planning for retreat; quite the opposite, in fact, as new development continues to take place. However, based on the results, there is an unconscious awareness and sometimes even a tacit acknowledgement that these places are likely impermanent in the face of impacts from sea level rise, coastal erosion, increased flooding, and stronger, more frequent storms. In both photographs and one-on-

one interviews (as well as focus groups discussions, see Chapter 2), participants highlighted how they are experiencing change, how it's impacting their lives, and how it shapes the way they think about the future of a place they care about deeply. Interestingly, participants were more candid about their experiences with and concerns about the impacts of climate change in the one-on-one interviews than they were in the more public-facing elements of the process, e.g., in their photographs and narrative statements as well as the focus group discussions. This reflects the assertion made by Wang and Burris (1997) that participants may self-censor due to the political nature of the practice of photography and the act of expressing community concerns. It also speaks to the value of incorporating interviews within the Photovoice process as a way to help ensure that important issues are not inadvertently overlooked or left out. Although the study did not set out to explore the dimensions and temporalities of climate-induced loss, it was an undercurrent that came up repeatedly. While it is not possible to say definitively whether the Photovoice process catalyzed this engagement with loss, it is worth exploring the ways that the methodology could be used as a practical way to foster engagement with loss and thus help to facilitate the process of place detachment.

Place detachment within a retreat context is not well defined in the literature. However, considering Agyeman et al.'s (2009) idea that it involves "intentionally loosening existing attachments" to place (pg. 512) and taking into account the three dimensions laid out in Barnett et al.'s (2016) "science of loss" (e.g., exploring place-based values, understanding lived experience with change, and preemptively engaging with loss), it is possible to consider some of the aspects of what that process could entail based on the results of this study. For example, preemptively engaging with loss involves the uncomfortable reality of confronting inevitable change and the losses it entails before disaster strikes. As a participatory method, Photovoice seeks to raise awareness, consciousness, and understanding of the issues that affect people's lives, including among participants themselves (Wang & Burris 1997). The Photovoice process in this study fostered an environment where participants could reflect on their own knowledge of and lived experiences with climate change as well as learn from those of others. In doing so, it created both time and space for people to process those changes and what they mean for their connection to place now and into the future. In reflecting on the Photovoice process, one participant stated, "Doing this project is tough in terms of going into those memories, those layers, you know? I guess I didn't realize there was so much." Another remarked, "Thank you for

pulling this project together, because I think it's probably started a few of us thinking in ways that we haven't paid attention to for a while." These comments suggest that Photovoice brings the subconscious forward in ways that, while still difficult to confront, can help people to process their memories, feelings, and concerns.

Detaching from place may also involve grappling with the recognition that there are limits to adaptive strategies and that trade-offs may have to made. Here, the Photovoice process can help to illuminate perceptions of, experience with, and/or support for different response strategies. Participants from both communities in this study frequently highlighted both the presence and the shortcomings of sea walls, including that they do not provide protection in the long-term (or, in some cases, even in the present term) and that they can change or negatively impact coastal dynamics by causing erosion in adjacent areas. Participants also viewed home elevation with some skepticism, in part because it changes the look and feel of their neighborhoods and is either cost prohibitive or impossible to do with their existing homes. However, they also recognized the utility of allowing for water to pass underneath homes and understood that doing so could lengthen how long people can stay in place. The Photovoice process helped to create space for participants to acknowledge and reflect on these trade-offs. Additionally, participants who are strongly attached to private ownership of the beach to low tide face a dilemma in that towns are unlikely to invest limited taxpayer-funded resources for adaptation or resilience efforts in areas that are not widely accessible to the public, a dynamic that is already playing out in Wells. The strong commitment voiced by nearly all participants to stay for as long as they can means that they will have to consider value trade-offs and address the tensions between determining what is worth protecting and what they are willing to sacrifice in order to maintain what they value, namely, remaining attached to place (Tschackert et al. 2017).

On the other hand, although participants were not prompted to do so, most participants reflected on and acknowledged the possibly that retreat may have to happen at some point in the future. This is an important finding because it suggests that people who are witnessing change in coastal areas start to grapple with the issue of retreat long before it becomes an option on the table. Retreat has a history of being controversial and divisive (Siders & Adjibade 2021), with recent examples of significant pushback from citizens and government officials alike in areas where it has been raised as an option (see, for example, Spiegel 2022 and Koslov 2016). Being able to elicit these perspective through the visual and dialogue-based approach of the Photovoice

process could offer a way for communities, planners, and policy makers to begin having difficult conversations about retreat both prior to the approach becoming a contentious, third rail topic and before certain thresholds are breached and/or disaster strikes.

Once the point of considering retreat is reached, place detachment would also likely entail the logistical aspects of considering when and how to leave a place. Determining when to leave a place depends on a number of factors, including identifying thresholds for risk tolerance and how long one can remain in place by adapting *in situ* (McNamara et al. 2016; Bronen 2011). Participants in this study enjoy relative economic privilege, as evidenced by their ability to own property, including second homes, in a wealthy coastal community and to maintain increasingly expensive flood insurance. However, the results indicate that, for several participants, certain adaptive strategies are out of reach because they are financially or logistically prohibitive. On a few occasions, participants suggested that they have wondered about the potential to "cash out" and sell their homes. FEMA does not provide assistance for secondary properties that have been damaged or destroyed due to natural hazards and disasters, including for rebuilding or buyouts (FEMA 2018). This puts second home owners in a somewhat tenuous position of attempting to thread a needle between selling their home to other private owners preventatively, passing on the risk to someone else and likely cutting off access to place or staying as long as possible and risking the potential to suffer total financial loss.

An alternative option to preemptively selling on the private market or accepting a government buyout post-disaster is for home owners to work with organizations who acquire land and put it into trust for conservation in perpetuity, such as land trusts or state and local governments. Several of the participants in this study were concerned with the legacy of their relationships with these places, including a desire for connection to be passed down to younger generations, which could be a leverage point for organizations like land trusts or government agencies to tap into. Encouraging people to consider their legacy has been shown to increase pro-environmental behavior (Zaval et al. 2015). Similar to government buyouts, electing to put land into trust for conservation means that the land is returned to or kept in natural condition and is often made accessible to the public as open space (Byrne 2012). This could help to ensure that, even if home owners elect to leave a place, future generations may still be able to return to and connect with what remains of a place that holds meaning for their family. Here, too, Photovoice could play a role in helping to memorialize the viewpoints, experiences, and stories of people

who have let go of place, as well as the place itself: Interpretive signs are a common fixture on public lands and could feature the images and narratives from participants of Photovoice projects.

Certainly, a key aspect of place detachment is addressing the grief associated with losing physical connection to a meaningful place. For participants in this study, place is a loved one that is being lost, but place also holds the memories of loved ones who have already been lost (see Chapter 2), so for them, the experience of grief is multi-layered. At its most fundamental level, photography records a moment in time. Time is fleeting, but so too are places that are changing more and more rapidly due to climate change. Before these places that people care about and are attached to start to become unrecognizable or even disappear, photography could, in one sense, help to preserve them. By asking the people who are connected to these places to, for example, capture the essence of what makes them meaningful or special, visual methods like Photovoice could be used as a process for supporting people through the grief of letting go of a place while also serving as a way to memorialize a place in time (Barnett et al. 2016). Photovoice processes could also be used to help visualize what the grief process looks like for people as they grapple with the potential need for retreat by exploring emotional responses to change and loss, including shock, denial, distress, fear, anger, anxiety, depression, pre- and post-traumatic stress, etc. (Marshall et al. 2019).

In the Photovoice process laid by Wang and Burris (1997), they emphasize the importance of giving the photos back to participants and their communities because it conveys appreciation and community-building. As part of a COVID-19 adaptation to the group discussion process, this study provided each participant with a physical booklet containing all of the photographs and narratives from their respective neighborhoods 1-2 weeks ahead of focus group discussions. Typically, participants only receive copies of their own photographs and do not have the chance to see other participant's photographs until they meet for the focus group discussion. This adaptation resulted in two beneficial outcomes. First, it allowed extra time and space for participants to review and reflect on one another's photographs, helping to create a sense of community and also fostering a deeper level of engagement in the participatory analysis process. Second, several participants expressed appreciation for the booklet as a kind of gift that captured their collective love of place in a way that they were excited to share with others. Both the individual photograph and photo booklet approaches provide participants with a tangible

memento of their experience in the project and, for processes focused on documenting place-based experience with climate change, a record of a meaningful place in time, but the booklet approach helped to capture a more complete and collaborative picture of a place in time.

Finally, one of the core goals of Photovoice is to reach policy makers and others in positions of decision-making power. In the context of decision-making about climate change, Photovoice can be an innovative way to conduct both participatory research and public participation when projects are intentionally linked with planning and decision-making processes. This research, for example, intersected with regional coastal resilience planning efforts as well as municipal planning processes. This was achieved by displaying the public exhibit during a full-day workshop for municipal officials and agency representatives, allowing for these local decision-makers to engage with the photographs and narratives during meeting breaks. As the workshop was not open to the public, the Photovoice exhibit also served as a way to bring in the voices, perspectives, and experiences of the participants. The ability to represent the values, experiences, and concerns of residents through a visual display creates opportunities to bring in their voices and viewpoints during processes that otherwise have little to no pathways for community engagement and public participation. Participation in decision-making is particularly valuable when differing values are involved and when local knowledge is needed to better understand the nature of the problem (Sprain 2016). Public participation also aids in identifying the types of response strategies that are likely to fit best with a community's needs, values, and aspirations (Few et al. 2007). This study, for example, shed light on the ways that sea level rise is impacting place and how it is affecting participants daily lives. It also helped to highlight how resident's attachment to place informed their perceptions about the different types of adaptation options that exist. Such information could be valuable to include in vulnerability assessment processes and the design of climate adaptation or coastal resilience pathways and plans, particularly those that include the option of retreat.

3.9 Limitations

There are several limitations of this study. First, results are only reflective of a small number of participants who self-selected to take part in the study. Although participants reflected the demographics of the broader population of coastal community residents in the town of Wells and, arguably, in Maine, they are not representative of the general population of people living on the coast throughout the US. Second, Photovoice is a qualitative, participatory method that

responds to and reflects specific community dynamics. The outcomes of this type of method are also shaped by characteristics and training of the researcher, including epistemology, reflexivity, and facilitative leadership skills. Thus, this research is not generalizable beyond the context of small, affluent, mostly seasonal, and predominantly white coastal communities and the results may not be replicable with other communities and/or by other researchers. As well, this research did not specifically set out to investigate the ability of Photovoice to serve as a tool for fostering a place detachment process, thus participants were not asked to reflect on or provide feedback about whether or not the method does so. More work conducting Photovoice projects focused specifically on place detachment with a greater diversity of communities, including those that are more demographically diverse as well as those who are at different stages of the retreat process, is warranted to help understand the potential for the method to facilitate the place detachment process.

3.10 Conclusion

If retreat is pursued as a preventative, adaptive action instead of in response to disaster, individuals and communities who are detaching from place will be faced with the need to preemptively engage with loss if they are not already doing so. This paper explored the potential of using a Photovoice methodology as an approach for engaging with aspects of loss and facilitating place detachment. The findings suggest that the nature of Photovoice – visual, participatory, multiple levels of engagement – is well suited to revealing the nuances and complexities of loss that people are navigating as they experience change in place. If retreat is considered as part of an adaptation spectrum that also includes protection and accommodation, the results of this study show that loss is being experienced at different temporal and spatial scales across the full spectrum. When strategies like sea walls are causing the loss of physical place in ways that erode people's sense of safety and elevated homes are changing the community character is ways that affect people's sense of place, then loss is already occurring for residents in this study even before the retreat enters into serious consideration. This finding echoes the concept of solastalgia, as participants exhibited varying levels of concern or alarm caused by a decreasing sense of stability and solace normally gained through their place attachment (Albrecht 2005). Better understanding and inclusion of these dimensions of climate-induced loss are needed in managed retreat planning and policy processes in order to support the social, cultural, and psychological needs of people as they let go of the places they are attached

to. The success of a loss-informed place detachment process would likely depend on the type of community engagement approaches used (Agyeman et al. 2009). As a deeply engaged methodology that forefronts lived, embodied, and place-based experiences, Photovoice is one tool of many that could be used to help build out both the theory and practice of place detachment in a climate-induced retreat context.

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REFERENCES

Adger, W.N., Dessai, S., Goulden, M., Hulme, M., Lorenzoni, I., Nelson, D.R., Naess, L.O., Wolf, J., & Wreford, A. (2009). Are there social limits to adaptation to climate change?. *Climatic change*, *93*(3-4), pp.335-354.

Adger, W. N., Barnett, J., Brown, K., Marshall, N., & O'Brien, K. (2013). Cultural dimensions of climate change impacts and adaptation. *Nature Climate Change*, *3*(2), 112-117.

Agyeman, J., Devine-Wright, P., & Prange, J. (2009). Close to the edge, down by the river? Joining up managed retreat and place attachment in a climate changed world. *Environment and Planning A*, *41*(3), 509-513.

Albrecht, G. (2005). 'Solastalgia'. A new concept in health and identity. *PAN: Philosophy Activism Nature*, (3), 41-55.

Baldwin, C., & Ross, H. (2012). Bridging troubled waters: Applying consensus-building techniques to water planning. *Society & Natural Resources*, 25(3), 217-234.

Baldwin, C., & Chandler, L. (2010). "At the water's edge": community voices on climate change. *Local Environment*, 15(7), 637-649.

Barnett, J., Tschakert, P., Head, L., & Adger, W. N. (2016). A science of loss. *Nature Climate Change,* 6(11), 976-978.

Bertana, A. (2019). Relocation as an Adaptation to Sea-Level Rise: Valuable Lessons from the Narikoso Village Relocation Project in Fiji. *Case Studies in the Environment*.

Bronen, R. (2011). Climate-induced community relocations: creating an adaptive governance framework based in human rights doctrine. *NYU Rev. L. & Soc. Change*, 35, 357.

Burley, D., Jenkins, P., Laska, S., & Davis, T. (2007). Place attachment and environmental change in coastal Louisiana. *Organization & Environment*, *20*(3), 347-366.

Byrne, J. P. (2012). The cathedral engulfed: Sea-level rise, property rights, and time. *La. L. Rev.,* 73, 69.

Cai, Y. (2015). Picturing climate governance: photovoice and public participation. Public Participation and Climate Governance Working Paper Series. Montreal: Center for International Sustainable Development Law.

Chandler, D., & Torbert, B. (2003). Transforming inquiry and action: Interweaving 27 flavors of action research. *Action research*, 1(2), 133-152.

Chiu, L. F. (2006). Critical reflection: More than nuts and bolts. *Action Research*, 4(2), 183-203.

De Sherbinin, A., Levy, M., Adamo, S., MacManus, K., Yetman, G., Mara, V., Razafindrazay, L., Goodrich, B., Srebotnjak, T., Aichele, C., & Pistolesi, L. (2012). Migration and risk: net migration in marginal ecosystems and hazardous areas. *Environmental Research Letters*, 7(4), 045602.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), 1-4.

FEMA (2018). FACT SHEET: Acquisition of Property After a Flood Event. https://www.fema.gov/news-release/20200220/fey-enfomasyon-akizisyon-pwopriyete-apre-yon-inondasyon. Accessed 9 January 2020.

FEMA (2016) National Mitigation Framework. https://www.fema.gov/sites/default/files/2020-04/National_Mitigation_Framework2nd_june2016.pdf. Accessed 9 January 2020.

Greenwood, D. J., & Levin, M. (2006). *Introduction to action research: Social research for social change.* SAGE publications.

Few R, Brown K, Tompkins E L (2007) Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate policy*, 7(1): 46-59.

Fox, N. J. (2011). Boundary objects, social meanings and the success of new technologies. *Sociology*, *45*(1), 70-85.

Heron, J., & Reason, P. (2006). The practice of co-operative inquiry: Research 'with' rather than 'on' people. *Handbook of action research*, 2, 144-154.

Hynes, G. (2013). First, second, and third person inquiry. Participatory research in palliative care: *Actions and reflections*.

Koslov, L. (2016). The case for retreat. *Public Culture*, 28(2 (79)), 359-387.

Mach, K. J., & Siders, A. R. (2021). Reframing strategic, managed retreat for transformative climate adaptation. *Science*, 372(6548), 1294-1299.

Maine Climate Council (2021). Sea level rise in Maine: An accelerating problem. https://climatecouncil.maine.gov/sea-level-rise-maine-accelerating-problem. Accessed 9 January 2020.

Maldonado, J., Wang, I. F. C., Eningowuk, F., Iaukea, L., Lascurain, A., Lazrus, H., Naquin, C. A., Naquin, J. R., Nogueras-Vidal, K. M., Peterson, K., Rivera-Collazo, I., Souza, M. K., Stege, M., & Thomas, B. (2021). Addressing the challenges of climate-driven community-led resettlement and site expansion: knowledge sharing, storytelling, healing, and collaborative coalition building. *Journal of environmental studies and sciences*, *11*(3), 294-304.

Manzo, L. C. & Devine-Wright, Patrick. (2013). *Place Attachment: Advances in Theory, Methods and Applications.* Routledge.

Marino, E. (2012). The long history of environmental migration: Assessing vulnerability construction and obstacles to successful relocation in Shishmaref, Alaska. *Global environmental change*, *22*(2), 374-381.

Marino, E. (2018). Adaptation privilege and Voluntary Buyouts: Perspectives on ethnocentrism in sea level rise relocation and retreat policies in the US. *Global environmental change*, 49, 10-13.

Marshall, N., Adger, W. N., Benham, C., Brown, K., I Curnock, M., Gurney, G. G., Marshall, P., Pert, P., & Thiault, L. (2019). Reef Grief: investigating the relationship between place meanings and place change on the Great Barrier Reef, Australia. *Sustainability Science*, 14(3), 579-587.

Marshall, N. A., Park, S. E., Adger, W. N., Brown, K., & Howden, S. M. (2012). Transformational capacity and the influence of place and identity. *Environmental Research Letters*, *7*(3), 034022.

McNamara, K. E., Westoby, R., & Chandra, A. (2021). Exploring climate-driven non-economic loss and damage in the Pacific Islands. *Current Opinion in Environmental Sustainability*, 50, 1-11.

McNamara, K. E., Bronen, R., Fernando, N., & Klepp, S. (2018). The complex decision-making of climate-induced relocation: Adaptation and loss and damage. *Climate Policy*, 18(1), 111-117.

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook.* 3rd.

Nowell, B. L., Berkowitz, S. L., Deacon, Z., & Foster-Fishman, P. (2006). Revealing the Cues Within Community Places: Storiesof Identity, History, and Possibility. *American journal of community psychology*, 37(1), 29-46.

Nykiforuk, C. I., Vallianatos, H., & Nieuwendyk, L. M. (2011). Photovoice as a method for revealing community perceptions of the built and social environment. *International journal of qualitative methods*, 10(2), 103-124.

Oppenheimer, M., B.C. Glavovic , J. Hinkel, R. van de Wal, A.K. Magnan, A. Abd-Elgawad, R. Cai, M. Cifuentes-Jara, R.M. DeConto, T. Ghosh, J. Hay, F. Isla, B. Marzeion, B. Meyssignac, and Z. Sebesvari. (2019). Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.-O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, A. Alegría, M. Nicolai, A. Okem, J. Petzold, B. Rama, N.M. Weyer (eds.)].

Radonic, L., & Jacob, C. (2021). Examining the cracks in universal water coverage: Women document the burdens of household water insecurity. *Water Alternatives*, 14(1), 60-78.

Reason, P., & Bradbury, H. (2008). Introduction. *The SAGE Handbook of Action research: Participative inquiry and practice,* 1-10.

Rubin, H. J., & Rubin, I. S. (2011). *Qualitative interviewing: The art of hearing data.* Sage.

Russo, S., Hissa, K., Murphy, B., & Gunson, B. (2021). Photovoice, emergency management and climate change: A comparative case-study approach. *Qualitative Research*, 21(4), 568-585.

Saldaña, J. (2014). Coding and analysis strategies. *The Oxford handbook of qualitative research*, 581-605.

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. Journal of environmental psychology, 30(1), 1-10.

Schumann, R. L., Binder, S. B., & Greer, A. (2019). Unseen potential: Photovoice methods in hazard and disaster science. *GeoJournal,* 84(1), 273-289.

Szto, P. (2008). Documentary photography in American social welfare history: 1897-1943. *J. Soc. & Soc. Welfare*, 35, 91.

Siders, A. R., & Ajibade, I. (2021). Introduction: Managed retreat and environmental justice in a changing climate. *Journal of Environmental Studies and Sciences*, 11(3), 287-293.

Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic change*, *152*(2), 239-257.

Spiegel, A. (2022). Apocalypse Creep. This American Life. WBEZ Chicago. https://www.thisamericanlife.org/762/apocalypse-creep. Accessed 9 January 2020.

Sprain L (2017) Paradoxes of public participation in climate change governance. *The Good Society* 25(1): 62-80.

Star, S. L., & Griesemer, J. R. (1989). Institutional ecology, ‘translations' and boundary objects: Amateurs and professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. *Social studies of science*, *19*(3), 387-420.

Tschakert, P., Ellis, N. R., Anderson, C., Kelly, A., & Obeng, J. (2019). One thousand ways to experience loss: A systematic analysis of climate-related intangible harm from around the world. *Global Environmental Change*, 55, 58-72.

Tschakert, P., Barnett, J., Ellis, N., Lawrence, C., Tuana, N., New, M., Elrick-Barr, C., Pandit, R., & Pannell, D. (2017). Climate change and loss, as if people mattered: values, places, and experiences. *Wiley Interdisciplinary Reviews: Climate Change,* 8(5), e476.

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health education & behavior*, 24(3), 369-387.

Wilson, N., Dasho, S., Martin, A. C., Wallerstein, N., Wang, C. C., & Minkler, M. (2007). Engaging young adolescents in social action through photovoice: The youth empowerment strategies (YES!) project. *The Journal of Early Adolescence*, 27(2), 241-261.

Zaval, L., Markowitz, E. M., & Weber, E. U. (2015). How will I be remembered? Conserving the environment for the sake of one’s legacy. *Psychological science*, 26(2), 231-236.

CONCLUSION: TOWARDS AN EMPATHETIC, LOSS-INFORMED, AND PARTICIPATORY APPROACH TO MANAGED RETREAT

"In the same way that a science of loss requires situated knowledge about those highly valued aspects of life and well-being that are at risk, it also requires grounded knowledge about desired futures, the contextual drivers of loss, and existing and potential adaptations. This is best done through co-production of knowledge where affected communities and researchers work together to generate knowledge and engage with decision makers."

- Barnett, Tschakert, Head, and Adger 2016, pg. 977

4.1 Conclusions

By exploring the role of public participation in environmental decision-making and the ways in which place attachment shapes experience with climate change, this dissertation contributes to the literature on the social dimensions of managed retreat. More important are the implications this research has for policy, planning, and practice.

In *Chapter One* I demonstrate a need for formalized guidelines that facilitate more meaningful and on-going participation in managed retreat decision-making in order to ensure that outcomes are equitable. Although managed retreat will require support on many different levels from federal agencies, the US currently lacks a formalized approach for guiding the process (Siders 2019; Bronen et al. 2018; Maldonado et al. 2013). Guidance on how decisions about managed retreat should be made and by whom also do not yet exist (Bronnen 2015; Siders 2019). However, based on the Critical Discourse Analysis that I conducted, current frameworks guiding the work of four federal agencies on climate change, coastal resilience, and public engagement do not provide appropriate models to follows because they fail to meet the standards of procedural equity. Since 2020, when I initially conducted this research, the federal government under the Biden administration has voiced support for and started providing financial resources to communities who wish to pursue retreat and relocation (see, for example, Flavelle 2022). As these initiatives expand, agencies will need to provide consistent guidance on how to implement managed retreat projects. The results of Chapter One can help to inform the development of these guidelines, especially with regard to understanding and addressing the role that power plays in the context of participation.

I build on these results in *Chapter Two* by providing insight on the types of social dimensions that participatory methods can uncover. The findings from the Photovoice study that I conducted alongside long-term residents of a coastal community in southern Maine provide evidence for incorporating affective dimensions of place attachment in coastal management policy and planning. These types of non-market based, intangible social dimension are not typically captured in traditional assessment and planning processes (McNamara et al. 2021; Tschakert et al. 2017; Barnett et al. 2016) but they mediate how people experience and respond to climate change, including how they make decisions about managed retreat (McNamara et al. 2020; Agyeman et al. 2009; Burley et al. 2007). The results of Chapter Two reveal that coastal residents are concerned about the impacts of sea level rise and are already considering what it means for their connection to place in the long-term. Underscoring the findings of Chapter One, they also want to be involved in the decision-making processes that affect the places they love. These results are useful for municipalities because they show the importance of incorporating the local knowledge, place-based values, lived experience, and future visions of residents in their climate assessment and coastal resilience planning processes. This research also builds theoretical knowledge about how place attachment is impacted by slow-onset environmental change. Additionally, to the best of my knowledge, this is the first study to use a Photovoice methodology to explore place attachment in the context of managed retreat.

Finally, in *Chapter Three*, I assert the value of using Photovoice as a tool for facilitating the process of 'place detachment' in order to help communities process the loss of meaningful places. The process of place detachment in a managed retreat context is underexplored (Agyeman et al. 2009), although an emerging 'science of loss' suggests that it would entail exploring the place-based values that people hold, understanding their lived experiences with climate change, and gaining insight into how people engage with and process loss (Tschakert et al. 2017; Barnett et al. 2016). Creative, participatory action research methodologies like Photovoice are well suited to exploring the types of lived, embodied, and place-based experiences that give meaning to loss of place (Tschakert et al. 2017; Barnett et al. 2016; Wang & Burris 1997). Drawing on qualitative analysis of photographs, narratives, and interviews, I present evidence that the Photovoice process creates time and space for participants to reflect on their lived experience with change, to consider value trade-offs, and to engage with loss. The findings show that, even when they are committed to staying in place for as long as they can,

participants also understand that "this place isn't forever." This research adds to the limited literature on place detachment by suggesting both an approach for facilitating the process and the dynamics of loss that may emerge through it. I also argue that Photovoice can be used as an applied approach by policy makers, land use planners, engagement practitioners, and coastal communities to support the social, cultural, and psychological needs of people as they let go of the places they are attached to. This is a novel contribution to both the theory and practice of managed retreat.

As the climate continues to change, more and more communities will be faced with making difficult decisions about how best to respond to its effects. Sea level rise, coastal erosion, and stronger or more frequent storms are not the only drivers of managed retreat: increasing heatwaves, drought, floods, wildfires, and other extremes may also drive people away from risk-prone areas (Siders & Ajibade 2021). The findings of this dissertation are applicable to different hazard contexts and add to a growing body of literature on the social dimensions of managed retreat. This research also reinforces that how we respond to the impacts of climate change isn't only a technical matter. It is also a very emotional one, especially for people who are facing the loss of places that are meaningful to them. Empathetic and loss-informed place detachment processes are needed to ensure that managed retreat does not exacerbate harm or inequitable outcomes. The success of such a process, and thus, of managed retreat itself, hinges on the type of community engagement approaches used (Agyeman et al. 2009). In this dissertation, I brought together frameworks and methods for participation (e.g., procedural justice, public participation, and participatory action research) to show that better frameworks for incorporating public participation in planning, policy, and practice are needed while also providing evidence of the value of using participatory approaches to engage communities in exploring the social dimensions of managed retreat. My hope is that the community members that I worked with, as well as communities throughout the US and around the world who are facing climate-induced loss, will benefit from this work.

4.2 A first person, critical reflection on the experience of conducting participatory action research as a doctoral student

Critical reflection and reflexivity are crucial components of qualitative research generally and of Participatory Action Researh (PAR) methodologies specifically (Cresswell & Cresswell 2018; Lincoln, Lynham, & Guba 2018; Chiu 2006). Chiu (2006) explains that critical reflection

serves at least three important functions: 1) as a form of research validity, 2) as a mechanism for giving voice to lived experience, and 3) as a tool for the creation of knowledge. Incorporating critical reflection on the dimensions of participation, the dynamics of power, and the role of the researcher sheds light on the inquiry process in a way that other researchers can evaluate for validity and learning purposes (Chiu 2006). Critical reflection at the first person level is a fundamental starting point. As a participant in the inquiry process, is it important to give voice to the self-reflexive experience of the researcher so that other researchers can better understand and learn from a PAR project (Chiu 2006). Reflexivity involves examining our own underlying beliefs and expectations as they relate to how we conduct ourselves throughout the research process (Cresswell & Cresswell 2018; Chiu 2006). Reflexive engagement thus allows us to grasp how our participation as researchers frames inquiry at all levels (first person, second person, and third person) and provides the opportunity for us to challenge our own assumptions, ultimately creating space for the type of change that PAR aspires to (Chiu 2006).

Conducting PAR in any situation can be challenging on a number of fronts, including building relationships, time requirements, power dynamics, tensions between rigor and relevance, researcher reflexivity, assessing validity and reliability, and more (Gittins 2019; Grant et al. 2008). These challenges can be amplified when graduate students conduct PAR as part of their thesis or dissertation requirements due to, for example, conflicting schedules and timelines, discrepancies in how success is measured, negotiating between the "I" of a PhD and the "we" of PAR, and determining who is accountable to whom (Gittins 2019; Klocker 2012). In the following sections, I give voice to my experience conducting PAR as part of my dissertation, including reflection on my positionality, the benefits I gained and the struggles I faced, and how I have approached validity in this research.

4.2.1 Positionality

Academic research is not objective, nor is it apolitical. Rather, research is a site of power, one that can reproduce and reinforce inequitable power relations among and between individuals, communities, and institutions (Smith 2007). As a participatory scholar-practitioner who seeks to work with diverse communities on issues related to equity and inclusion in climate change decision-making, it is critical for me to recognize the types of power and privilege that I carry as a result of my personal background, academic training, and professional affiliations. One way for me to do this is to understand my positionality. Interrogating my positionality entails identifying

what my position is in relation to the social, cultural, and political contexts of any given research project or study, which may be shaped by dimensions of my identity (race, class, gender, age, etc.) as well as my values, worldview, and beliefs about the nature of knowledge (Rowe 2014). To position myself, I am a cisgendered, heterosexual, white woman of settler descent on the cusp of 40 who comes from a lower class background but currently enjoys moderate wealth and is highly educated. I locate myself at the intersection of critical theory, constructivism, and participatory research paradigms. Positionality affects most, if not all, aspects of the research process, from "the way the question or problem is initially constructed, designed and conducted to how others are invited to participate, the ways in which knowledge is constructed and acted on and, finally, the ways in which outcomes are disseminated and published" (Rowe 2014, pg. 628).

In the field of PAR, positionality also relates to the issue of insider – outsider dynamics in research relationships, where the way that I (the researcher) am positioned and relate to the community (the insiders) that I am engaging with in an inquiry process matters if I am going to conduct research with, rather than on, people (Rowe 2014). The insider – outsider dynamic was, indeed, present in the research I conducted with community members in Wells, Maine. I was an outsider because, for example, I am not from nor have I ever lived in coastal Maine. Mainers are famous for their skepticism of outsiders: if you were not born and raised in Maine, you are "from away." I moved to southern Maine in fall of 2020 because I was motivated by a desire to decrease my outsider perspective and position by building relationships with people and place. Doing so resulted in me gaining some insider status, stemming especially from my connection to the Wells National Estuarine Research Reserve, which provided me with both insider knowledge and access to people and resources.

4.2.2 Benefits

In some ways, my "from away" distinction served as an advantage as it created a natural framing for wanting to learn from and co-produce knowledge with people who had local knowledge and lived experience. Since my research is heavily focused on place, I also took it as an opportunity to begin developing my own relationship with and sense of place. This involved regular visits to the coast, including the beaches of Wells. As a person born and raised in the mountainous region of the desert southwest but who had previously lived on the Atlantic in the highly urbanized northeast, the coastal landscapes in Maine were still foreign to me. The extent

of the wide, flat, sandy beaches at low tide is truly something to marvel at as are the marshy estuary systems that connect rivers to the sea. Driving along the coast or walking along the beaches of southern Maine and seeing the proximity of houses to the ocean and marshes was eye-opening – particularly driving on the low-lying roads that cross the marshes and connect the barrier beach-like coastal neighborhoods to the mainland. It was and remains difficult for me to not immediately perceive the situation as precarious and to wonder at how the people who lived in these areas perceived that risk. To be honest, my first thought when I see homes located in low-lying, oceanfront areas is always, "That place is not long for this world." I often wonder, especially when I see new construction, what people are thinking when they choose to live in such exposed places.

Using a PAR method like Photovoice provided an opportunity for me to explore these questions about perceived risks and the future of coastal places with people who had long-term connections with place and lived experience with the impacts of sea level rise – to literally see their perspectives through photographs and stories. The process of building relationships with the participants and establishing trust with them took time and was not without it challenges, but it provided the opportunity for me to practice critical reflection at both the first person and second person levels. The incredible kindness, openness, enthusiasm, and generosity that participants showed me made the experience personally rewarding to me. They shared their time, their trust, their stories, their homes, their emotions, their gratitude, and more with me. Several participants thanked me for the opportunity to participate, even giving me place-themed gifts to express their appreciation and serve as a memento of their meaningful place. That this research was personally relevant and meaningful to them helps me to understand the validity of the work. Seeing through their eyes what they care for and are concerned about in place also affected my relationship with the research by shifting my perspectives, increasing my understanding, and changing my interpretations of what it is like to love a place that is being impacted by sea level rise. This has strengthened my dedication to working with communities on the frontlines of climate change and to bringing the social dimensions to the forefront of policy, planning, and practice. It has also motivated me to continue working on managed retreat but from a more empathetic, loss-informed perspective. The ability to carry this research forward into the professional work I plan to do after my PhD and the potential for it to effect positive change at the local, regional, state, and federal level makes this experience incredibly valuable and meaningful for me.

As a first-generation college student with both a Bachelors and Masters of Arts, my dissertation was the first time I designed, planned, and implemented a scientific research project. Through my previous professional experience, as well as during a research assistantship early on in my doctoral studies, I have supported or participated in various aspects of existing research projects, but this was my first time leading one. To say that I learned a lot from the experience of using a PAR method as part of my dissertation is a great understatement. As a first-gen, I was close to clueless about what a the process of attaining a PhD entailed. Of course, I expected to learn new things, including how to be a researcher, and to be challenged by new concepts. However, I never expected to be so fundamentally changed at both the personal and professional levels by the experience of learning how to be a qualitative researcher and PAR practitioner. The process of learning about the theories of PAR, especially those related to reflexivity at the first person, second person, and third person levels of inquiry, changed my relationship with myself and with other. My experience putting these theories into practice has made me a more curious, empathetic, and reflective human which makes me a better researcher and collaborator.

4.2.3 Struggles

One of my major concerns about this work is that I worry that I was not transparent enough with the participants I worked with about my research interest in either climate change or managed retreat. I did not frame the Photovoice study as being about either of these topics when I recruited and trained participants. The reason for this was that I wanted to see if these topics would emerge from the participants throughout the process. They absolutely did, including during the focus group discussions when participants identified change over time was a key theme and in the interviews, where I did not broach the topic of climate change unless a participant brought it up and 11 out of 12 did. But the process of writing up the research and situating it within the context of climate change and especially of managed retreat leaves me feeling uneasy. When I think about taking this work back to the participants for their feedback or reflections, I worry that they will feel deceived or manipulated or potentially even angry if they perceive my focus on managed retreat as meaning that it is a strategy that I am suggesting they are in the process of considering or one that I am promoting as a solution. I acknowledge the likelihood that both my background working in climate change and my perspectives on the choice to live in places that are highly exposed to natural hazards led me to probe deeper on

these topics during data collection, thereby shaping the kind of data that emerged, and to identify them more readily in the data analysis process, thus influencing the results.

The fact that I did not share the two chapters with the participants before submitting them as part of my dissertation makes me wonder if this work actually is PAR or if it is just PAR-lite. That I have not yet taken this step is not just because I am nervous about their reaction, it is also because the realities of trying to finish my PhD within a certain time frame makes it challenging to build in time for 12 people to review and provide feedback on drafts and for me to incorporate their suggestions or address concerns. As well, I am somewhat loath to ask them to dedicate even more of their time to this process considering the amount of time they invested throughout the Photovoice process. This is not to say that I do not want or intend to share this research with them after I complete the dissertation and before I publish articles – I do, and I will. I do feel as if I am in a paradoxical space as a doctoral student between wanting to stay true to PAR and worrying that doing so will upend the relatively limited scholarly work I have done to date.

I also struggled with was the wealth and privilege of the people I conducted Photovoice with. Prior to this point, my research had focused on engaging with underserved, marginalized communities. I worried that, because of its emphasis on giving voice to the lived experiences of people without power and resources, Photovoice was an inappropriate tool to use with wealthy, white communities or, worse, that I was co-opting the methodology. However, through extended engagement in the field with people and place as well as with planning and policy initiatives at the local level, I came to realize that many of the participants felt powerless against both the rising tides of the ocean and the inertia of local decision-makers to respond to them. As well, a few participant were hesitant about certain images or statements being shared publicly because they were worried about the potential ramifications of raising community concerns. These dynamics speak to the political nature of photography and talking about local issues (Wang & Burris 1997) and also highlights the fact that money cannot protect you form everything. I also had to acknowledge that the demographics of this coastal community are similar to many others in the US who will have to navigate the process of retreat and, regardless of wealth or privilege, they are experiencing varying levels of emotional distress that warrants attention and empathy. Looking at the bigger picture, managed retreat of any community is going to be an enormous challenge for this country to maneuver and the findings I present in this dissertation reveal important dynamics to consider.

4.2.4 Choice, Quality, and Validity

Assessing the rigor of qualitative, participatory research is tied to considering the relational, ethical, and societal outcomes of the work. Reason (2006) describes four dimensions of PAR that can be used as criteria for assessing quality: pursuing worthwhile purposes, democracy and participation, many ways of knowing, and emergent development form. He explains that, in each of these dimensions, there are choices that we must make throughout the research process. It's not about making the "right" choices but about making the choices that best fit the needs and context of our participatory research, and also clearly documenting and articulating how and why those choices were made. It's this last point about making choices that helps me to understand that there is no one "right" way to do PAR but rather a thousand different ways to be a good practitioner of PAR. Reflecting on the process and experience of conducting the Photovoice project, I am relatively comfortable and confident in saying that I have met these four criteria.

In this dissertation I sought to understand how people are affected by sea level rise and how they respond to in order to inform adaptation policy and planning. I engaged with, learned from, and responded to the emergent needs of community members who have lived experience with sea level rise using an approach that brings together experiential, presentational, propositional, and practical ways of knowing. I created opportunities for the broader community, including decision-makers, to engage with this knowledge. The choices that I made with regard to how I framed the research when I initially approached participants as well as those that I've made about the timing of sharing the results with them have ultimately been made in response to the context of doing this work as part of my dissertation. Although that is a limitation that required some sacrifices, I do not believe it negates the value of the work.

Evaluating validity in qualitative inquiry involves interrogating our trustworthiness, authenticity, credibility, and the ethics of our relationships to participants and the reserach (Lincoln et al. 2018; Cresswell & Miller 2000). Research should use multiple validity procedures to assess their work, which include but are not limited to: data triangulation, member checking, the use of rich, thick description, clarifying researcher bias, presenting discrepant information, peer debriefing, and spending prolonged time in the field (Cresswell & Cresswell 2018). In Table 6, I have indicated the validity procedures I utilized in the three chapters of this dissertation. Lincoln, Lynham, and Guba (2018) provide a practical indicator for thinking about validity,

asking ourselves, "Would I feel sufficiently secure about these findings to construct social policy or legislation based on them?" To this, I answer an emphatic yes – I actively hope the findings of this dissertation influence policy and other decision-making process.

Table 6: Validity Procedures Within Qualitative Lens and Paradigm

Paradigm Assumptions / Lens	Post-Positivist Paradigm	Constructivist Paradigm	Critical Paradigm
Lens of the Researcher	Triangulation ★	Disconfirming evidence ★	Researcher reflexivity ★
Lens of the Study Participants	Member checking ★	Prolonged engagement in the field ★	Collaboration ★
Lens of People External to the Study (e.g., Reviewers, Readers)	Audit Trail ★	Thick, rich description ★	Peer debriefing ★

★ Indicates validity procedure used in this dissertation
(Adapted from Cresswell & Miller 2000)

4.2.5 Takeaways

It is likely inevitable that struggles will be face and sacrifices will be made in the research process when PAR methodologies are used in a doctoral dissertation. However, this is not unique to PAR. For me, the process of learning how to become a qualitative, participatory scholar-practitioner within a PhD program greatly increased the impact that the doctoral experience had on me. Taking the time to practice critical self-reflection at the end of my time as a PhD student has also provided me with the space to reflect on my past, present, and future self and to better understand the arc of what led me here and where it could take me next. I am so grateful for this opportunity – what an experience it has been.

REFERENCES

Agyeman, J., Devine-Wright, P., & Prange, J. (2009). Close to the edge, down by the river? Joining up managed retreat and place attachment in a climate changed world. *Environment and Planning A*, *41*(3), 509-513.

Barnett, J., Tschakert, P., Head, L., & Adger, W. N. (2016). A science of loss. *Nature Climate Change*, 6(11), 976-978.

Bronen, R., Maldonado, J. K., Marino, E., & Hardison, P. (2018). Climate change and displacement: Challenges and needs to address an imminent reality. In *Challenging the Prevailing Paradigm of Displacement and Resettlement* (pp. 252-272). Routledge.

Bronen, R. (2015). Climate-induced community relocations: using integrated social-ecological assessments to foster adaptation and resilience. *Ecology and Society*, *20*(3).

Burley, D., Jenkins, P., Laska, S., & Davis, T. (2007). Place attachment and environmental change in coastal Louisiana. *Organization & Environment*, *20*(3), 347-366.

Chiu, L. F. (2006). Critical reflection: More than nuts and bolts. *Action Research*, *4*(2), 183-203.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, *39*(3), 124-130.

Flavelle, C. (2022). In a First, U.S. Pays Tribes to Move Away From Climate Threats. The New York Times. https://www.nytimes.com/2022/11/04/climate/native-americans-relocate-climate-change.html. Accessed 14 January 2023.

Gittins, P. (2019). Doing Participatory Action Research as a Doctoral Student in the Peace and Conflict Studies Field. *Peace and Conflict Studies*, *26*(2), 5.

Grant, J., Nelson, G., & Mitchell, T. (2008). Negotiating the challenges of participatory action research: Relationships, power, participation, change and credibility. *Handbook of action research*, 589-607.

Klocker, N. (2012). Doing participatory action research and doing a PhD: words of encouragement for prospective students. *Journal of Geography in Higher Education*, *36*(1), 149-163.

Lincoln, Y., Lynham, S., & Guba, E. (2018). Paradigmatic controversies, contradictions and emerging confluences, revisited. *The Sage handbook of qualitative research* (5th ed., pp. 108–150). Thousand Oaks, CA: Sage.

Maldonado, J. K., Shearer, C., Bronen, R., Peterson, K., & Lazrus, H. (2013). The impact of climate change on tribal communities in the US: displacement, relocation, and human rights. In *Climate change and indigenous peoples in the United States* (pp. 93-106). Springer, Cham.

McNamara, K. E., Westoby, R., & Chandra, A. (2021). Exploring climate-driven non-economic loss and damage in the Pacific Islands. *Current Opinion in Environmental Sustainability*, 50, 1-11.

McNamara, K. E., Bronen, R., Fernando, N., & Klepp, S. (2018). The complex decision-making of climate-induced relocation: Adaptation and loss and damage. *Climate Policy*, 18(1), 111-117.

Reason, P. (2006). Choice and quality in action research practice. *Journal of management inquiry*, *15*(2), 187-203.

Rowe, W. (2014). Positionality. In D. Coghlan & M. Brydon-Miller (Eds.), *The SAGE encyclopedia of action research* (pp. 628-628). Thousand Oaks,, CA: SAGE Publications Ltd.

Siders, A. R., & Ajibade, I. (2021). Introduction: Managed retreat and environmental justice in a changing climate. *Journal of Environmental Studies and Sciences*, 11(3), 287-293.

Siders, A. R. (2019). Social justice implications of US managed retreat buyout programs. *Climatic change*, *152*(2), 239-257.

Smith, L. T. (2005). On tricky ground. *The Sage handbook of qualitative research*, *3*, 85-107.

Tschakert, P., Barnett, J., Ellis, N., Lawrence, C., Tuana, N., New, M., Elrick-Barr, C., Pandit, R., & Pannell, D. (2017). Climate change and loss, as if people mattered: values, places, and experiences. *Wiley Interdisciplinary Reviews: Climate Change*, 8(5), e476.

Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health education & behavior*, 24(3), 369-387.

APPENDIX A: INTRODUCTORY TRAINING SESSION PROTOCOL

What Makes This Place Special Photovoice Project

Overview of Today

Informed Consent

- Review consent forms and make sure everyone voluntarily agrees to participate

Introductions

- Invite participants to share their first name and how long they have had a connection to [this place]

Project Overview

- Share details about who I am and what my research interests are
- Share high level overview of project motivations and goals

Photo Instructions

- Review guidance documents and photography tips
    - Instruction graphic
        - Consent forms for images containing identifiable details (e.g, faces), including under 18 years of age
        - Safety
        - Photos should not include details that can be used to identify you or others (e.g., names of people or addresses/phone numbers, photos of people's faces or other features that can be used to identify them). We will not be able to use photos with identifying details in our study. Also, please put your safety first. Do not do things that you would not otherwise do (e.g., stand in a risky place) to get a photo.
    - Photography tips
    - Reflection prompts
- Prompt: Think about pictures that you might share on social media or send to another person to show them what makes you feel connected to [this place]. As you go about your days in the next couple of weeks, if there are moments that express what makes [this place] special to you, snap a picture and share it. Don't think too much about this. We will use these photos in our next conversation – you'll share a bit with me about why you took them and what they say about your relationship with [this place].

Share an example photo that I recently took in [this place]

- Ask participants to reflect on what they think it communicates or means to me
- Share why I took the photo: what made me take this picture and what does it show about my connection to place?

Q & A

APPENDIX B: PHOTOVOICE INSTRUCTION GRAPHIC

[NEIGHBORHOOD NAME] PHOTOVOICE INSTRUCTIONS

Photos should answer the question:
When it comes to [this place], what do you care about most?

TIMELINE

Over the next two or so weeks, you will take between 5 and 15 different photos of [this place] – the places where you enjoy spending your time, the activities you do while there, and the characteristics that make it a special place for you. Each photo should be accompanied by a short, descriptive caption.

During this period of photo taking, I'll contact you once or twice with a reminder to share your photos with me by email, text, or upload. We will discuss the photos you took during our interview, which will take place via Zoom or, if conditions permit, in person.

YOUR PHOTOS COULD INCLUDE IMAGES OF:

- Beaches, homes, walkways
- Water, animals, plants
- People visiting, recreating, working
- Different times of the day or night

Photos can be literal (i.e. photos of a particular area of the beach) or symbolic (i.e., photos of quietness or solitude). Be creative!

EVERY PERSON SHOULD INCLUDE AT LEAST ONE PHOTO OF:

- A physical location or natural feature in [this place] that is special to you
- An activity that you enjoy doing in [this place] , either by yourself or with others
- Something that recalls a memory or experience in [this place]
- Anything that you might be concerned about in [this place]

IMPORTANT NOTES

- Photos should not include details that can identify you or others
- Your safety comes first! Please do not do anything you wouldn't normally do (such as stand in a risky place) to capture an image

Figure 19: Photovoice Instruction Graphic

APPENDIX C: WRITTEN REFLECTION PROMPTS FOR PHOTOVOICE IMAGES

What Makes This Place Special Photovoice Project

Choose one of the following prompts to help tell the story of your photograph!

Sense poem

Write a poem by filling in the following sense prompts about your photograph. This might require you to think back to when you took the photo and/or use your imagination to think of how you sensed the world around you while taking photos. After the sentences are complete, you can choose to leave as is or take out the prompting words (provided) and read the remaining poem.

I hear…
I smell…
I see…
I taste…
I touch…
I feel…

Word Association

Look at your selected photo and make a list of any words or ideas that jump into your head. Don't worry if they don't seem to connect to the photo at first. If you're stuck— a good place to start is by writing what you can physically see in the photo.

Question and Answer

When thinking about the photo you selected and the story you are trying to tell about your perspective or experience with community and/or prompt, answer the six questions below. You can leave them in that format, or combine your answers to create a call to action.

When?
Where?
Who?
What?
How?
Why?

SHOWeD

Reflect on your photograph by answering the following questions. They can be left as question-answer, or you can use your responses to build a narrative for your photograph.

What do you **S**EE here?
What is really **H**APPENING here?
How does this relate to **O**UR lives?
WHY does this opportunity, concern, or strength exist?
What can we **D**O about it?

Letter to the Editor

Write a letter to the editor of a local newspaper or blog explaining the issue or story in your photograph. Are you calling for change or action?

The Unseen

Describe what's not seen in this photo. What story is taking place around it? What happened before this moment? What is likely to happen afterwards?

APPENDIX D: SEMI-STRUCTURED, IN-DEPTH INTERVIEW PROTOCOL

What Makes This Place Special Photovoice Project

- Intro
    - Thank you so much for taking the time to share your stories about Drakes Island with me today, I really appreciate it. I just have a few basic questions that I want to start with. Can you please tell me:
        - Name?
        - Age?
        - Full time or seasonal?
            - If seasonal – how long do you typically spend here?
        - Property owner?
            - If yes - is your property adjacent to either the beach or the marsh?

- Review of photographs and captions
    - Let's start by talking about the photographs you took over the past few weeks. Let's take a look at your pictures. Start by **picking between 3 and 5 pictures that are most important to you or that you think is the strongest representation of your connection to Drakes Island.** Tell me about them. What is the picture of? What was going on when you took it? Why is this photo important? What story does it tell me?
        - (Discussion should be guided by the photos, but interviewer should probe around the topics discussed previously in questions above – relationship with place and past, present, and future perceptions).

- Past
    - Now I would like to hear more about the history of your relationship with this place.
        - How long have you lived / visited here?
        - How did you come to live in / visit this place?
        - (Prompt) Do you have family history here, and if so, can you tell me a bit about that?

- Present
    - Let's talk now about your current connection to this place.
        - What is special to you about this place?
        - What does this place mean to you?
        - What keeps you here / what keeps you coming back to this place?
        - What kinds of things do you enjoy doing here?
        - What are the challenges of living here?
        - Have you seen this place change over time, and if so, how?
            - Socially (Community)
            - Environmentally (Physical)

- Future

- Finally, I would like to hear your thoughts about the future of this place.
    - Do you think your relationship with this place will change in the future, and if so, how?
    - Do you think this place itself will change in the future, and if so, how?
        - (Prompt – ask if participant brings up climate change / global warming) How do you think environmental changes will affect this place?
            - (Prompt) If there ever came a point when this place was at-risk, how might you respond?
            - (Prompt) If you ever had to make a decision about whether to stay or go, how would that impact you?
    - What hopes do you have for the future of this place?
    - What are you worried about, what are you excited about, what do you hope for in the future?
    - What keeps it from being the kind of place you would like it to be in the future?

APPENDIX E: PHOTO BOOKLET INSTRUCTIONS TO PARTICIPANTS

Exploring What Makes [This Neighborhood] a Special Place: A Photovoice Project

Summer 2021

Hello! Thank you so much for your ongoing participation in this project. I have thoroughly enjoyed seeing your photographs and hearing your stories about [this place] – I've learned so much already about your connection to this special place. Now is our chance to learn together as a group!

This booklet contains the photographs and captions that you all shared with me, which were taken in response to the question, "When it comes to [this place], what do you care about most?" They are arranged anonymously and in no particular order.

Before our group discussion, please take some time (about 30 minutes to one hour) to do the following:

- Look through the photos
- Read the captions
- Jot down your thoughts and reflections
- Make a note if you see common themes, similar stories, and/or shared concerns

As always, if you have any questions or concerns, don't hesitate to reach out.

Looking forward to talking soon!

Jessica Brunacini
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APPENDIX F: FACILITATED FOCUS GROUP DISCUSSION PROTOCOL

What Makes This Place Special Photovoice Project

DISCUSSION ITEMS

Re-introductions

- First name
- One thing you learned / enjoyed / found challenging about the Photovoice process

Ground rules and goals of the discussion:

- For this sake of privacy and openness, please keep the identify of your fellow participants confidential. It is okay to talk with others about *the content* of the conversation, but please do not talk about anything that would identify other participants
- As a reminder, the main goals of the group discussion are to share stories with one another and to collectively identify common themes, topics, concerns, etc.

Common themes that THEY identified

- By now, everyone should have received and spent some time reviewing the booklet featuring everyone's photos and captions. Hopefully, you jotted down your thoughts and reflections about what you saw, and also made notes if you recognized any common themes, similar stories, and/or shared concerns
- Ask for volunteers for who would like to go first in sharing what they identified while reviewing everyone's photos
    - Allow participants to guide the discussion, probing for clarity and agreement / disagreement where necessary

Discuss common themes that the researcher/facilitator identified (IF they are not raised by participants), including:

- Family connections
    - Multigenerational
    - Gathering place
    - Memories
- Change
    - Natural cycles / ebbs and flows - ocean, daily tides, lighting
    - Human-caused environmental – sea level rise, jetties, erosion
        - High tide is higher
        - Dunes are no longer here
        - Washed out roads
    - Community character – new development, scale of new homes, armoring
- Access(ibility)
- Wells National Estuarine Research Reserve and Rachel Carson National Wildlife Refuge
    - Protecting place
- Future uncertainty
    - This place isn't forever…
    - Different generational perspectives

Looking ahead

- Next step - public display
  - Which themes should we highlight? Which one are most important…
  - Are there any photos / captions that they DO NOT want displayed?
  - Physical and/or digital gallery space?
- Where the research goes from here
    - Analysis
    - Write-up
    - Publication as part of dissertation
        - Opportunities for participants to provide input / feedback

Final thoughts

- Reflections?
    - Reflections on Photovoice process (if time allows, ask for feedback on process)
- Questions?
- Concerns?

APPENDIX G: QUALITATIVE ANALYSIS CODEBOOK FOR PHOTOVOICE STUDY

What Makes This Place Special Photovoice Project

Table 7: Codebook for Qualitative Analysis of Photovoice Data

Code	Sub-Code 1	Sub-Code 2	Sub-Code 3	Definition
Access				Physical access to place
	Who			Who has access to this place
		Beach ownership		Residents with beachfront property own to the low tide, beach is thus private
			Threat	Private ownership of beach is a threat to the community
			Special	Private ownership of beach is part of what makes place special
	How			How is this place accessed (e.g., via road, walkway, parking lot)
		Impede		An impediment to how access is gained (e.g., flooded road, gated walkway, damaged path)
Activity				Activity done in place, individually or with others
	Recreation			Recreation-specific activity done in place (e.g., Kite surfing, Walking, Kayaking, Swimming, Surfing, Boogie board, Play, Making music, Birding, Tubing

Table 7 (cont'd)

Affective				Moods, feelings, and attitudes related to place
	In this place I feel / this place feels			I feel ___ in this place / This place feels ___ (e.g., gratitutde, humbled, grief, relaxing, calming)
	Care			I care about this place
		Stewardship		I care about this place and that makes me feel a sense of stewardship (e.g., to protect, to be responsible for, to seek balance)
	Concern			I am concerned about ___ in this place.
	Identity			This place shaped or shapes the person I am / who my family is
Lived Experience				Personal knowledge about place gained through direct, first-hand observations of and engagement with place
	Tenure in place			Length of time spent living in or visiting place
		Intergenerational		Connection to place shared across multiple generations
		Seasonal		Connection to place on a seasonal basis
	Change over time			Changes to place observed over time

Table 7 (cont'd)

		Community character		Observations of change in community character over time
			Development	Community character change related to development (e.g., building new or bigger homes)
			Divisiveness	Community character change related to social division
		Environmental change		Observations of change in environmental conditions over time
			Climate change / global warming	Specific mention of climate change / global warming
			Sea level rise	Specific mention of sea level rise
			Erosion / acretion	Specific mention of sand or soil descrasing (erosion) or increasing (acretion) in certain locations
			Flooding	Specific mention of flooding
			Higher high tides	Specifiic mention of high tide getting higher
			Stronger storms	Specific mention of stronger storm activity
			Changing weather patterns	Specific mention of changing weather patterns

Table 7 (cont'd)

			Other effects or impacts	Other effects or impacts related to environmental change (e.g., damage, displacement, etc.)
Physical Environment				Connection to place experienced or appreciated through the physical environment
	Built			Human-built structures being special part of place.
		House / home		Family house / home as a personal special place
	Natural			Connection to place linked to natural aspects of the physical environment
		Patterns / Cycles		Natural patterns and cycles observed in place. Includes: Tides Sunrise / Sunset Weather (includes storms) Seasons Life cycles (e.g., birth-death)
		Characteristics		Distinguishing features of the natural environment ("personality of place")
			Dynamic	Natural environment described as ever-changing

Table 7 (cont'd)

			Beauty	Natural environment described as having beauty or being beautiful
			Power	Natural environment described as having power or being powerful
			Beach qualities	Description of the beach (e.g., wide, flat, sandy)
			Island	Description of place having physical qualities of an island (e.g., isolated, separate)
			Unique	Description of place as being unique
			Ecosystem	Co-habitation of humans and non-humans
			Estuary	Place where river and ocean meets
		Biotic / Abiotic		Living (animals, plants, shells*) and non-living (rocks, light, water, air) factors appreciated or observed in place
	Location			Specific location in place
		Beach		Specific mention of beach
		Marsh		Specific mention of marsh

Table 7 (cont'd)

Preserves				Federally conserved lands that are considered a special part of place (includes Wells Reserve / Laudholm Farm and Rachel Carson National Wildlife Refuge)
Protection				Strategies used to "protect" place, including hard / soft infrastructure, policy, behavior change, etc. E.g.: Sea wall Rip rap Jetty Sand dunes Hay bales Restricting access Zoning
Sensory				Connection to place through sight, sound, smell, touch, etc.
	View			Specific mention of or appreciation for the view that is afforded by / in this place
Social				Social connections to place
	Family / Friends			Social connections with family / friends in place
		Gathering place		Place as a convener of family / friends
		Traditions		Traditions that occur with friends / family in place
Temporal				Relationship with place as expressed in relation to time

Table 7 (cont'd)

	Past			Relationship to place remembered or recalled thorugh personal memories or family history (more narrative or story-based than observational)
		Link to present		Place as a connector between past and present (including with people who have passed on)
	Future			Place as imagined or visioned in the future (including anticipated or implied changes)
		Hope		Hope about the future of place
		Uncertainty		Uncertainty about physical place or relationship to place in the future