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"Smells Fishy": Exploring Sense of Place Salience in Community Rejection of Closed Net-Pen Aquaculture in Frenchman Bay, Maine

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“SMELLS FISHY”: EXPLORING SENSE OF PLACE SALIENCE IN COMMUNITY REJECTION OF CLOSED NET-PEN AQUACULTURE IN FRENCHMAN BAY, MAINE

By

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An Abstract of the Thesis Presented
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The global population is rising, and with it, demand for protein, particularly seafood. Aquaculture, the farming of aquatic species such as finfish, shellfish, and kelp, has been proposed as an alternative to wild-catch fisheries, of which 75% are overfished or at capacity. In Maine, aquaculture is growing, but often faces mixed community response when new or expanded projects are proposed. In the summer of 2020, a large-scale closed net-pen farm for Atlantic salmon (*Salmo salar*) was proposed for Frenchman Bay, Maine. Community reaction was instantaneous and overwhelmingly negative. The strong, unified response from residents in the towns of Bar Harbor and Gouldsboro prompted questions regarding bay salience and values attached to the bay by community members. Using a grounded theory approach, semi-structured interviews were conducted with town managers, national park officials, and advocacy group members regarding their views on finfish aquaculture, their attachments to Frenchman Bay, and

why they might support or reject the proposed salmon farm. Iterative coding of interview transcripts found emergent themes of scale, community character, aesthetic, historical, and recreation-based place attachments, and adjacent marine tensions including permitting and licensing processes, the shrinking of Maine's wild-catch fishing industry, and the gentrification of coastal spaces. Further discussion of emergent themes and recommendations for community managers and industry members are included.

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CHAPTER 1
INTRODUCTION

"Something smells fishy!" the opening to a 2021 *Bangor Daily News* op-ed declares. The opinion piece, written by Prospect Harbor resident Kathleen McFadden, is vehemently in opposition to a proposed closed net-pen salmon farm which would occupy space in Frenchman Bay, a body of water between Mount Desert Island and the coastal mainland in "downeast" Maine (Figure 1). McFadden goes on to call American Aquafarms, the company behind the project, "foreign," their marketing "propaganda," and concludes by calling the project a "self-serving, profit-driven proposal" (McFadden, 2022). It's hard to believe that something to do with *fish*, of all things, could elicit such a strong reaction. And yet, for McFadden and dozens of other individuals and groups representing lobstermen, fishermen, tourists, recreationalists, town governments, Acadia National Park, waterfront property owners, Indigenous peoples, and the company itself, this project has huge implications, made further nebulous and contentious by individual and group identities and attachments.

Figure 1. Map of the Frenchman Bay watershed in midcoast Maine. Image: Maine Coast Heritage Trust.

The global population is rising, and with it, demand for protein, particularly seafood, especially as consumption patterns and global wealth change over time (Joyce & Satterfield, 2010; Naylor et al., 2021; Schafer et al., 2010). Though demand for seafood is skyrocketing, over 75% of wild-caught fisheries are exploited or beyond capacity, making shellfish, seaweed, and finfish aquaculture a promising alternative to meeting demand while offering a smaller environmental footprint (Joyce & Satterfield, 2010; Naylor et al., 2021; Schafer et al., 2010). Securing property privileges for coastal spaces, however, proves difficult. As Joyce and Satterfield (2010) explain, "securing property rights of a tenuring system are inherently necessary for developing farm sites," (p. 107) yet securing those privileges requires privatizing formerly publicly accessible spaces. This results in a "shut-out" of certain marine resources users, especially Indigenous peoples, of which "few [have] established rights to land or resources under treaty settlements" (Joyce & Satterfield, 2010, p. 107). In Frenchman Bay, lobstermen and other marine-resource users are concerned with the impact a large-scale finfish farm could have

on their industries and personal livelihoods, as well as their access to coastal waters (Bever, 2021; Gurney et al., 2022; McFadden, 2022). This privatization also continues the ongoing project of Indigenous land dispossession that has been occurring in Frenchman Bay for hundreds of years (Bever, 2021).

Aquaculture in Maine, especially for finfish, is currently finding itself in the spotlight. This is not the first time that aquaculture has captured public attention in Maine. In the 1970s, relatively recent history, experimental Cohoe salmon farming began in Maine, and by 1973 the "modern era" of finfish aquaculture in Maine had been launched (MDI Historical Society, 2022). Salmon aquaculture was seen as a new way for fishermen to capitalize on Maine's cold waters and attempt a new form of entrepreneurship, especially as the sardine industry collapsed, and many began building salmon pens in their backyards before the industry grew to become more corporate (MDI Historical Society, 2022). As Natalie Springuel explains in an "Chebacco Chat" with the MDI Historical Society, "these things that make Maine attractive to global companies today [for finfish aquaculture] were the same things that attracted global companies in the 1980s and 90s" (MDI Historical Society, 2022, 16:16). Maine was quickly recognized as a good place to grow salmon on a global scale, and various forms of finfish experiments were seen "downeast" and even around Mount Desert Island through the early 2000s (MDI Historical Society, 2022).

Today, headlines abound in local papers such as the *Bangor Daily News*, *MDIslander*, and *Ellsworth American* about new proposed aquaculture projects, community members disavowing "industrial" farming, and anti-fish-farm boat parades organized to show solidarity with lobstermen (Baldwin, 2021). Jonesport, Belfast, and Bucksport, Maine are all seeing

proposals for land-based recirculating aquaculture systems (RAS) to raise yellowtail and Atlantic salmon, and in the summer of 2020, the communities of Bar Harbor and Gouldsboro[1], populations 5,559 and 1,703 (U.S. Census Bureau, 2022), respectively, learned about a US-based, Norwegian-owned company called American Aquafarms which wanted to raise Atlantic salmon in Frenchman Bay – the focal point of these communities. The proposed farm would occupy two 60-acre leases, host 15 closed net-pens at each lease site, and have a total capacity to raise 36,000 tons of Atlantic salmon annually (American Aquafarms, 2022; Bever, 2021). American Aquafarms also expressed intent to purchase the former Maine Fair Trade Lobster Facility in Gouldsboro, now defunct, and convert the property into a fish hatchery and processing plant (American Aquafarms, 2022).

"I think it's a disgrace the fishermen are up against something like this," a Gouldsboro resident expressed angrily to the *Ellsworth American* (Baldwin, 2021). "This will certainly affect our children and grandchildren," another chimed in, concerned over potential environmental and quality of life impacts (Baldwin, 2021). Opposition groups with names such as Frenchman Bay United and Friends of Frenchman Bay quickly sprang up, and assistance flooded in from their supporters such as Protect Maine's Fishing Heritage Foundation (Baldwin, 2021; Bever, 2021). Signs with slogans such as "Save our Bay" and "Say NO to industrial fish farming!" appeared up and down the main roads on Mount Desert Island, in front yards and next to piles of lobster traps (Figure 2). American Aquafarms' history was dug up; community members were outraged to

[1] Other communities impacted by the Frenchman Bay watershed include Lamoine, Hancock, Franklin, Sullivan, Sorrento, Trenton, Fletcher's Landing, and Winter Harbor, but for the purposes of this study we focus on the towns of Gouldsboro and Bar Harbor due to their bay proximity and community response to the American Aquafarms proposal.

learn that the company's initial founder and CEO, Mikael Roenes, served 2.5 years in jail in Norway for financial fraud linked to the 2008 financial crisis (Baldwin, 2022). Roenes is open about his past, even describing it on his LinkedIn profile, and was replaced by Keith Decker in 2021, but community distrust remained (Baldwin, 2022). To further complicate matters, the proposed aquaculture facilities would be located within viewing distance from the summit of Cadillac Mountain in nearby Acadia National Park and would sit only 3.3 miles from the town of Bar Harbor (Bever, 2021).

Figure 2. A "Save our Bay" sign in opposition to the American Aquafarms proposal in Bar Harbor on Mount Desert Island. Photo: L. Martin, 2022.

A project of such large scope and size, in historically shared waters and "in the shadow" (Bever, 2021) of a national park, elicited strong reactions from locals and visitors to Mount Desert Island and neighboring Gouldsboro alike. As of April 2022, the proposed project's permit application had been rejected by the Maine Department of Marine Resources (DMR), a development which pushed the company's projected project timeline back by 2-3 years (White, 2022). The permit was denied because the company's proposed source of salmon eggs did not meet the state of Maine's criteria for genetic requirements (White, 2022). American Aquafarms

is currently “reviewing the DMR’s comments in its response” (White, 2022), and has not yet canceled the project as the company is still eligible to re-apply. The neighboring communities are waiting to see what happens next.

The American Aquafarms proposal touched on contentious issues of change which are surrounding many Maine coastal towns. In addition to aquaculture, increased tourism, rising home prices, more federal regulations in coastal waters to protect the North Atlantic Right Whale, and the recent loss of the lobster industry’s sustainability certification from the Monterey Bay Aquarium’s Seafood Watch (Ogrysko, 2023) are all appearing on Maine’s small, idyllic coast, challenging fishermen, locals, and summer homeowners to face a changing land- and sea-scape. These issues permeate the entire state; conversations are held in classrooms, at farmer’s markets, and on the street about “what will happen” to these communities. The subject of change for small coastal towns even inspired an original musical titled “Trapped!: A lobster tale,” in which a lobsterman must decide if he wants to allow a scientist and a real estate developer to change the “heart and soul” of his island town, Krusty Isle. (The developer is the ‘bad guy’ for the entirety of the show, and ends the musical eaten by a giant lobster.) (Penobscot Theatre Company, 2023). “It’s so sad, isn’t it?” a woman behind me mused during Trapped!’s intermission, as we sat in a theater in Bangor, an hour and a half from Mount Desert Island. “Developers come in and just ruin these places.”

The American Aquafarms proposal for Frenchman Bay seemingly sparked community controversy, piquing my interest as a long-time Maine visitor and new Maine resident. This project proposal felt significant; previous research on aquaculture has shown a split in community support or rejection, usually based on trust or risk perceptions which vary across

stakeholders (Britsch, 2021; Johnson & Rickard 2022; Rickard et al., 2022). The response from stakeholders in Bar Harbor and Gouldsboro, combined with quick town action to publicly disavow American Aquafarms, felt unique. What is it that prompted such a quick response, especially when Maine as a state has such a long history of fisheries and aquaculture? Were the towns looking for more time to deliberate the project, or were they looking to postpone development indefinitely? Was there a place in between? It wasn't as if a salmon farm was something new to Maine; Cooke Aquaculture, which owns a salmon farm near Black Island, Maine[2], has been in operation since 1985 (Fry et al., 2018). There had to be something I was missing: something about the people, something about the place, or something about the moment in time.

For my Master's thesis, I asked: how does sense of place impact community acceptance/rejection of the Frenchman Bay aquaculture project? What is the salience of Frenchman Bay to stakeholders, and what values and meaning do they attach to it? Broadly, how does sense of place impact willingness to accept environmental risk, and how can a study of this particular case be applied elsewhere? My work intends to add to sense of place (SoP) literature via a case situated within aquaculture and entangled with environmental risk, as well as to the emerging framework known as "climax thinking" (Sherren et al., 2022; Sherren, 2020) which addresses idealized concepts of place. Understanding environmental risk-taking and barriers to change, particularly in projects marketed as more "sustainable" or with a lesser environmental footprint than traditional projects, will be essential as humans continue to study and implement

[2] Cooke Aquaculture also owns and operates salmon farms in Washington State, Canada, Chile, and Scotland. The Washington sites' future status is unclear as Washington State is locked in a series of legal battles over banning net-pen aquaculture in its state waters.

measures to combat rising populations and the adverse effects of climate change. These questions are important to communication studies specifically, especially those focusing on meaning-making, by seeking to understand how communication theories such as SoP and climax thinking 'translate' into community social networks and individual behaviors. For social science more broadly, these questions look to understand relationships and how they are entangled with personal and community level feelings, beliefs, and interactions, affecting physical project implementation.

THESIS OVERVIEW

This is the story of two communities grappling with change. Bar Harbor is a wealthy town with a bustling tourism and recreation economy, while Gouldsboro is much smaller and sees income from small-scale lobster fisheries and a growing retiree population (U.S. Census Bureau, 2022). Both of these communities, based on their positions on Frenchman Bay and the Maine coast, are seeing visual, character, community, and bay use changes. A number of factors are influencing their responses to large-scale change, such as the proposed American Aquafarms salmon farm, including perceptions of the Department of Marine Resources' capabilities, growth in tourism, an influx of retirees or people "from away" purchasing homes in the area, a decline in working-class fisheries employment and practice, and environmental changes from the results of human impacts and global warming (Gurney et al., 2022; GMRI, 2022; Rappaport, 2023). These issues are enmeshed, and one cannot understand the impact of the American Aquafarms proposal without considering these adjacent items.

This thesis is written and organized to provide a holistic picture of the background context preceding the American Aquafarms project in Frenchman Bay, followed by research into motivations and values which influenced stakeholder acceptance/rejection of the proposed

salmon farm. Chapter 2 presents a literature review on sense of place framework, with emphasis on place attachments and identities and the emerging concept of climax thinking. Sense of place specifically in regard to aquaculture is also discussed, alongside a history of aquaculture in Maine. The “aquaculture in Maine" sections provide a brief overview of all aquaculture in Maine before offering details on Atlantic salmon (*Salmo salar*) farming along the Maine coast. Methodologies of previous studies are also briefly reviewed. Chapter 3 details an overview of grounded theory, epistemological, ontological, and ethical orientations used in this study, and a description of the qualitative methods used to gather data on stakeholder perceptions of Frenchman Bay and the American Aquafarms proposal. Chapter 4 presents the results and discussion of findings. In Chapter 5, the conclusion, I summarize my findings, reflect on the changing nature of the Maine coast, and present a series of suggestions for stakeholder consideration. Suggestions are intended to provide a sort of “toolbox” which can be used to facilitate current and future discussions over community change along the Maine coast.

CHAPTER 2
LITERATURE REVIEW

The background literature regarding sense of place (SoP) and values and beliefs is vast, as is the literature regarding aquaculture growth and the seafood sectors both globally and in the state of Maine. In order to provide guiding context for this research, and to build the research questions which employ both sets of literature in a communication context, the following literature review has been created. An overview of terms used occurs first, followed by a review of SoP and the many terms it encompasses, as well as SoP applications in large-scale development projects. Next, global aquaculture growth is explored, followed by an overview of aquaculture in Maine and the tensions it is currently seeing. It is my hope that this order can help establish the importance and application of SoP, provide examples of its application in social science works, and stress the importance of the growing aquaculture sector and why studying human symbolic actions (communication) within it offers a useful body of literature for furthering sustainable development and understanding the dynamics of community change.

"Sense of Place" is an overarching concept used to describe the relationship between people and spatial settings. It is not "imbued in the physical setting itself, but resides in human interpretations of setting" (Jorgensen & Stedman, 2001, p. 233), and seeks to understand the meanings people attach to places through the process of living in it (Jorgensen & Stedman, 2001; Lewicka, 2005). SoP is broad, and encompasses a wide range of further inquiries such as place attachments and place identities (Carlisle et al., 2014; Devine-Wright, 2009) which are sometimes applied as their own theories and sometimes applied as sub-frameworks of SoP (Devine-Wright & Batel, 2017). While research in the communication discipline to date has employed SoP and connections to environment (e.g., Cantrill, 1998; Thompson & Cantrill,

2013), only a small fraction of such studies have applied these concepts to project siting decisions (e.g., Boyd, 2017), or the aquaculture context (e.g., Johnson & Rickard, 2022), leaving room for further research and development.

A NOTE ON COMMUNITY

The term "community" can have multiple meanings to different people or within different fields. For the sake of this research, "community" refers to the individuals living within a locality (towns of Bar Harbour and Gouldsboro, ME) who identify it as home and share collective behaviors, emotional bonds, and perceptions with one another to form a group-level shared social network and physical place. This working definition is guided by Mihaylov and Perkins' (2014) chapter on Community Attachment and Social Capital. This definition is also flexible, as occasionally interviewees used the term to refer to not just their town, but as encompassing their town and neighboring localities who occupied similar positions along the bay – having economies based in tourism, recreation, and some amount of working waterfront, and whose physical and social infrastructure felt threatened by an influx of tourists or those "from away."

SENSE OF PLACE

The sense of place (SoP) framework has been used in fields from geology to sociology to communication, describing and assessing people's relationships to the multiple dimensions of the spaces they inhabit (i.e. physical, perceptual, experiential, cognitive) (Bergquist et al., 2020) and offering both empirical and theoretical evidence that links peoples' connections to place (Eaton et al., 2019). Rooted in sociology, human geography, and social psychology, SoP "conceptualizes places and the meanings associated with them as socially constructed, but also probes the implications of these socially constructed meanings for individuals' interactions with place" (Bergquist et al., 2020, p. 2).

Place, according to Devine-Wright (2009), differs from "space" or "environment" as it describes not just physical aspects of a specific location, but also the variety of emotions and meanings associated with the locations by individuals or groups. It is a distinct way of thinking about social research, stressing "emplacement," in which physical and spatial contexts are more than mere backdrops to social and psychological phenomena" (Devine-Wright, 2009, p. 427). "Places" in question can be small (a backyard) or large (Frenchman Bay). Individuals often have meanings associated with places, which can be symbolic, responding to the question "what kind of place is this?" (Bergquist et al., 2020, p. 2), or cognitive and emotional, based on the physical element of place (Bergquist et al., 2020). Understanding people's attachments to, and identities formed from, places are critical for understanding the emotional bonds an individual or a community can have with a place they live or visit frequently, which is imperative in understanding people's engagement in specific behaviors (Eaton et al., 2019), including resistance to or acceptance of landscape change (Chappell et al., 2020).

Place attachments

Place attachments are emotional bonds to a place, both the process of becoming attached and the actual product of that attachment (Carlisle et al., 2014; Devine-Wright, 2009). People create emotional bonds with places after experience(s) in specific geographic locations, resulting in sets of feelings about those specific places (Devine-Wright and Batel, 2017). Place attachment as an element of SoP suggests that people or communities with stronger emotional bonds to places are more likely to resist changes to those places (Chappell et al., 2020). NIMBY, or "Not In My Backyard," has been commonly used to explain public opposition to new developments, offering the idea that residents want to "protect their own turf" (Devine-Write, 2009, p. 430) and providing an individual-level explanation for project opposition determined by "ignorance,

irrationality, and selfishness" (Devine-Wright, 2009, p. 431). NIMBY, however, has been largely discredited, and place attachment theory offers another way to think about place-protective behaviors (Chappell et al., 2020; Devine-Wright, 2009). It has been suggested that place attachments may serve as a defense against identity crises in transitional periods between developmental stages (Lewicka, 2005). Stronger place attachments are often associated with more time spent in places, as well as stronger place identity (Lewicka, 2005).

Place identity

Place identity "relates to the dimensions of self that develop through interaction with the environment via beliefs, preferences, feelings, values, etc." (Carlisle et al., 2014, p. 126). Physical and symbolic attributes of a place can contribute to an individual or group's sense of identity, and when change is proposed for a place, it can lead to a feeling of attachment disruption or identity threat which challenges bonds made based upon place (Carlisle et al., 2014; Devine-Wright & Batel, 2017). People-place bonds are not always obvious; most are unconscious or subconscious until rendered salient, such as when changes to a place are proposed, or a relocation from one place to another occurs (Devine-Wright & Batel, 2017). Some researchers refer to place identity as a theory, while others apply it as a concept of SoP framework. For the purposes of this research, place identity is applied as a framework, guiding the research questions.

Understanding landscapes

Landscapes are intersections, bringing together physical characteristics and human perceptions and experiences of place (Hanley et al., 2009). This is relevant to SoP as places also bring together the physical and emotional, albeit on a different level: landscapes are *backdrops* to phenomena and function as intersections, whereas places are variable in size based on an

individual's experience and function as *part* of social and psychological phenomena (Bergquist et al., 2020; Devine-Wright, 2009). Individuals' understanding and rating of landscape quality often depend on that individual's perspective of landscape use, be it aesthetic, ecological, or purely utilitarian (Chappell et al., 2020; Hanley et al., 2009). Preferences for landscape use "depend both on the nature of that landscape… and on the person whose preferences are being sought" (Hanley et al., 2009, p. 1405), meaning landscape preferences can vary widely. Overall, the meaning of "landscape" is complex: it goes beyond just the physical place and integrates "what people perceive about past, current and future uses of that environment [and] their attitudes and relationship with an area" (Hanley et al., 2009, p. 1405).

"Built landscapes" are landscapes which result from the interactions between humans and the environment, changing over time to meet evolving objectives and societal needs (Chappell et al., 2020). Built landscapes differ from more general landscapes as "built" landscapes are useful and practical over attractive, hosting utilitarian infrastructure created by humans to meet societal needs, i.e. wind turbines or fossil fuel pump jacks (Chappell et al., 2020). As built landscapes prioritize utility over aesthetics, they offer unique opportunities to understand how communities respond to landscape change, especially over time as societal needs shift (Chappell et al., 2020; Keilty et al., 2016). A multitude of research has been done in community response to change in built landscapes, especially in regards to energy development (Chappell et al., 2020; Keilty et al., 2016). Landscape change has been found to be identity-threatening to individuals, in line with place identity theory which suggests that bonds to places form parts of the self, and when places are threatened, those bonds, and therefore senses of self, are threatened as well (Carlisle et al., 2014), leading to high resistance to change.

Resistance to Change

Place attachment theory suggests individuals or communities have emotional bonds with the locations they live in or visit often, and those with stronger attachments are more likely to resist changes to those locations (Chappell et al., 2020). Bonds with places create attachments linked to identity, and places can thus be interpreted as identity-forming or integral to an individual or community's identity (Chappell et al., 2020; Hanley et al., 2009). Rural communities in particular have been found to hold particularly strong place attachments and connected identity associations; strong place attachment in rural areas has been found to create strong barriers to accepting change in those areas (Chappell et al. 2020), most likely because the potentials of change could alter sense of place, biophysical attributes, and social and cultural meanings for an individual (Hanley et al., 2009). More generally, attachment and emotional connection often means that potential changes are often seen "as a threat to one's meaning of place," (Keilty et al., 2016, p. 234), as well as personal identity.

Community acceptance and rejection of landscape changes are not a new challenge. In renewable energy, citizens "often support the idea… in general, but specific acceptance is always conditional upon a project suiting the specific landscape and its community" (Keilty et al., 2016, p. 234). In renewable energy projects in particular, general support for projects is often initially high, but after a specific proposal, community support declines due to concern over landscape impacts (Chappell et al., 2020; Keilty et al., 2019; Sherren et al., 2022). However, over time even initially rejected projects can come to be embraced by citizens. In a study of proposed removal of a failing hydroelectric dam in New Brunswick, Canada, Keilty et al. (2016) found that individuals who viewed the dam construction, which had occurred over 47 years prior to interviews, as initially negative now opposed the dam's removal. Individuals stated they were

concerned that dam removal would cause “yet another negative period of change” (Keilty et al., 2016, p. 241) after they had watched the dam area develop into a “stable ecosystem” (Keilty et al., 2016, p. 241) over the past years. This shift in thinking – from rejection of a project to embracing it as an integral part of the built landscape – has caused the emergence of the new theory of climax thinking.

RESILIENCE THEORY

Resilience refers to the amount of disturbance a social-ecological system can tolerate before moving to a different state controlled by a different set of processes (Carpenter et al., 2001). Originating in ecology, the term “resilience” has been developed to have diverse definitions which allow it to be applied to a variety of interdisciplinary work studying the interactions between humans and nature (Carpenter et al., 2001). One of these applications of resilience is in social resilience. Social resilience is “the ability of groups or communities to cope with external stresses and disturbances as a result of social, political, and environmental change” (Adger, 2000, p. 347). Resilience, especially social resilience, is often used in conjunction with adaptive capacity, and is generally seen as increasing capacity to cope with stress and disturbance and decreasing vulnerability (Adger, 2000; Carpenter et al., 2001). Understanding resilience as it applies to social and ecological systems can help to understand the dependency between social systems and the environment, and the direct linkages between the welfare of both (Adger, 2000).

The emerging concept of climax thinking contains similar ideas to resilience theory, but differs in terms of adaptation and iteration. While resilience theory takes into account how much disturbance a social-ecological system can undergo before reaching a new state with a new set of processes governing it, climax thinking encompasses community and individual level

attachments which can prevent adaptation. Thus, climax thinking might be considered under the umbrella of resilience theory, but as an explanation for some resistance to adaptive capacity.

Climax Thinking

Climax thinking is an emerging theory which borrows terminology from succession theory in plant ecology to provide a framework for understanding resistance to landscape change. In plant ecology, a climax plant community is a stable community, dominating "in a given site and set of conditions after a predictable sequence of previous communities" (Sherren et al., 2022, p. 476), returning to its equilibrium, or climax, state after a disturbance. This theory has been debunked in plant ecology[3], and critiqued in the resilience literature, yet may have use in understanding community and individual opposition to change (Sherren, 2020; Sherren et al., 2022).

Climax thinking is the "widespread misconception, characteristic of Western contexts, that our current landscapes are ideal or even fated" (Sherren et al., 2022, p. 476). In climax thinking, individuals believe that the landscape they currently have is the intended, inevitable end point for that place. Even after a disturbance, individuals will prioritize a return to the "climax" landscape as opposed to changing in response to the disturbance (Sherren, 2020). As Sherren (2022) explains, what communities hold as possible for a landscape is often limited by

[3] The concept of a single climax state for any community has been discarded as research in plant ecology has shown that the multiple drivers of change present in any community can create multiple different "end states" ecologically. For more on this, see Meiners et al. (2014) in volume 29, issue 2 of *Functional Ecology.*

what already exists or has occurred there: “dominant landscape ideals represent a powerful sociological imaginary” (p. 476). As such, climax thinking also represents a barrier to change.[4]

Sherren (2020) argues that climax thinking is a barrier to landscape transformations, particularly for sustainable development in energy, agriculture, and environmental restoration. Since climax thinking reinforces the idea that the ideal use for a landscape has been reached, and that use of the landscape is inevitable, it can limit the possibilities individuals and communities see for future landscape use and thus hinder actual development or change. Sense of place and place attachments also contribute to this barrier: emotional investment and ‘lock-in’ “[become] a sort of social infrastructure that rejects change to retain identity and honor past generations” (Sherren, 2020, p. 3). Climax thinking must be addressed and overcome, as it also contributes to socioeconomic inequalities: it is a “luxury, afforded the socially, politically or economically powerful who can maintain their own climax landscape at the expense of others” (Sherren, 2020, p. 3).

Sense of place and sustainable development

Many studies have examined how SoP impacts interactions between communities and proposed sustainable development projects, specifically within the scope of the energy sector and with a focus on potential economic impacts[5] (Bergquist et al., 2020; Carlisle et al., 2014, Devine-Wright, 2009). These studies examine proposed wind farms, solar farms, or gas pipelines, and attempt to understand which members of a community may accept or reject the proposed projects based on perceived economic impacts. Often, individuals who perceive a landscape as

[4] Climax thinking may have relevance in studying colonialism and whiteness, i.e. climax thinking acting as a “code” for colonialism with the preservation of white settler towns as ideal or beginning communities. This is outside the scope of this work but merits noting.

[5] Also see exurban development literature.

industrialized view these proposed infrastructure projects positively and welcome the economic impacts the projects could bring. Those who view their communities as "pastoral respites" (Bergquist et al., 2020, p. 7), in contrast, worry about property devaluation and other negative community impacts such as a disruption of aesthetics. A focus outside of economic impacts, seeking instead to understand social impacts of proposed projects, could offer an enhanced perspective which explains community or individual responses which seem unaligned or unexplained by economics.

SENSE OF PLACE WITHIN AQUACULTURE

While SoP has been examined mostly within energy infrastructure, some literature does exist examining SoP, aquaculture, and coastal use. SoP studies situated within coastal space and aquaculture often focus on uncertainty over economic benefits and risks, uncertainty over potential cultural changes, waterfront access, and environmental risks (Joyce & Satterfield, 2010; Rickard et al., 2022; Rickard et al., 2020; Shafer et al., 2010). Literature focuses mostly on coastal spaces. Traditional waterfront users express varying concerns over developing aquaculture, with resource-dependent workers such as shellfish harvesters stating that aquaculture harms wild fisheries and expressing concerns that aquaculture could eventually displace wild harvests and reduce their ability to maintain a part-time or subsistence lifestyle (Joyce & Satterfield, 2010). This trend is already experienced by Indigenous peoples who require access to coastal and open waters but experience conflicts in regard to their territorial rights (Joyce & Satterfield, 2010). Other waterfront users, such as recreationists and waterfront property owners, tend to focus more on access and aesthetics (Shafer et al., 2010).

Studies suggest that proximity to waterfront and coastal spaces is an important factor in aquaculture development salience (Shafer et al., 2010), in line with place attachment theory. In

aquaculture, projects are received with a mix of perceptions regarding risks, benefits, and "naturalness." In some communities, aquaculture is seen as a "natural" extension of existing fishing economies, complimenting traditional fishing heritage, while in others, aquaculture is seen as a competitor to wild-caught fisheries (Gurney et al., 2022; Rickard et al., 2022). Understanding why certain groups react the way they do to proposed aquaculture development projects "can help in gathering public input, managing public reaction, and creating a more acceptable change scenario" (Shafer et al., 2010, p. 561)[6].

PERCEPTIONS OF AQUACULTURE

Perceived risks and benefits of aquaculture often co-occur, "most often with near-equal prominence" (Rickard et al., 2020, p. 2). Support for aquaculture projects has been found to be aligned with perceived benefits and risks, proximity to project site, and perceptions of place identity (Rickard et al., 2020; Shafer et al., 2010). Perceived benefits of aquaculture can include economic benefits, such as creating jobs in a community, community benefits, such as revitalizing brownfield sites, and environmental benefits, such as removing pressure from wild aquatic populations (Johnson & Rickard, 2022; Rickard et al., 2020; Shafer et al., 2010). Place identity further impacts support; "the acceptability of aquaculture in a given locale may be idiosyncratic – founded on, for instance, value-based perceptions of 'lived experience,' and linked to historically grounded assessments of the costs and benefits of aquaculture expansion" (Rickard et al., 2020, p. 7).

Opposition to aquaculture is due to various perceptions including seeing it as unethical or unnatural, as utilizing risky, untested technology, and as having a high negative environmental

[6] Also see Grant Murray's work on aquaculture in British Columbia.

impact (Johnson & Rickard, 2022; Joyce & Satterfield, 2010; Rickard et al., 2020). A lack of trust in science can lead to opposition to aquaculture, as can a lack of perceived credibility of industry information (Rickard et al., 2020). Proximity also plays a role in influencing strength of response to proposed marine development projects, with those living closer to proposed projects more likely to oppose new aquaculture proposals than those living further away (Shafer et al., 2010). Visual character is also often a main point of contention, with a "lack of fit" for a landscape leading to rejection of proposed change (Dalton & Jin, 2018; Carlisle et al., 2014; Chappell et al., 2020). Conflict with wild-capture fisheries can also impact aquaculture opposition (Gurney et al., 2022). Many aquaculture projects see a mix of support, opposition, and positions in between due to the nuanced nature of aquaculture perceptions and actual impacts (Britsch et al., 2021; Rickard et al., 2022).

Social license to operate

There is an increasing awareness and interest in community response to aquaculture operations (Ford et al., 2022; Rickard et al., 2022; Whitmore et al., 2022). Understanding social barriers to aquaculture development is essential, with community acceptance and approval of incoming industry providing a better chance for successful project development (Whitmore et al., 2022). Social license to operate (SLO) is "a conceptual framework through which to recognize and explore social grievances" (Ford et al., 2022, p. 1), applied across extractive sectors such as mining, forestry, oil, gas, and terrestrial and marine environmental governance. While there are many definitions of SLO, it is encompassed in its breadth by "the ongoing acceptance and approval of a project by local community members and other stakeholders" (Ford et al., 2022, p. 1). SLO carries dimensions of trust and credibility (Ford et al., 2022; Rickard et al., 2022). Within aquaculture, SLO is complex; aquaculture sites require the creation of private space

through leasing or ownership, leading to serious ramifications for local communities (Ford et al., 2022). One of the strongest predictors for SLO in aquaculture contexts is community-industry interactions. SLO cannot be created simply through acting in ways which are perceived as credible, but need to include the act of continually building relationships which are "informative, respectful and positive" (Ford et al., 2022, p. 2). Without a relationship of trust, communities may perceive higher risk and more threats to their sense of place and identities (Ford et al., 2022; Johnson & Rickard, 2022a; Rickard et al., 2022; Devine-Wright & Batel, 2017), meaning securing SLO is essential for many industry projects if they do not wish to face community resistance.

AQUACULTURE GROWTH

Aquaculture is a food production sector which includes the farming of fish, crustaceans, shellfish, and aquatic plants in fresh and saltwater bodies (Fry et al., 2018) and which is rapidly expanding. In the 20-year period from 1997 to 2017, global aquaculture production more than tripled in live-weight volume, growing from 34 million tons (Mt) to 122 Mt (Naylor et al., 2021), became more diverse, with 40% more fish, shellfish, algal, and aquatic plant species cultivated in fresh, marine, and brackish water systems (Naylor et al., 2021), and surpassed global beef production (Fry et al., 2018). In 2018, more than half of all seafood produced globally was farmed (Fry et al., 2018). While 75% of global edible aquaculture volume comes from freshwater fish species, marine resources have considerable use in growing markets such as kelps or as use for fish feed (Naylor et al., 2021).

As wild-caught fisheries catch rates are stalling or shrinking, indicating full or overexploited capacities, finfish aquaculture is growing in response (Fry et al., 2018; Naylor et al., 2021). Near- or off- shore finfish farms operate by raising fish in cages or net pens near the

water surface or water column, producing large numbers of fish for markets. Finfish farms have the opportunity to alleviate pressures on wild fish populations, diversify local marine economies, contribute to coastal community resilience, and restore coastal and marine habitats (Britsch et al., 2021; Fry et al., 2018; Naylor et al., 2021), but come with a set of concerns. Notably, near-shore finfish operations often contend with ecosystem and public health issues, such as "1) fish escapes, 2) disease pressures and treatments, 3) fish waste, and 4) occupational health and safety" (Fry et al., 2018, p. 5). In the United States, commercial nearshore net-pen finfish aquaculture sites are limited to Maine, Washington State[7], and Hawaii, with a total of less than ten farms combined (Fry et al., 2018).

AQUACULTURE IN MAINE

In Maine, wild-caught fisheries and various aquaculture projects including mussels, oysters, scallops, seaweed, and Atlantic salmon (*Salmo salar*) contribute significantly to the state economy, with salmon aquaculture alone representing roughly 80% of all total aquaculture and valued at approximately $74 million (Britsch et al., 2021). Currently, all near-shore salmon farms in Maine are owned and operated by Cooke Aquaculture, the fifth largest salmon producer in the world (Fry et al., 2018). Though salmon aquaculture is currently monopolized by Cooke, Maine has recently attracted a host of international companies looking to develop land-based Recirculating Aquaculture Systems (RAS) or novel, closed net-pen nearshore aquaculture sites alongside smaller, local opportunists who are looking to expand Maine's shellfish and seaweed sectors. By 2020, there were 179 aquaculture leases in the state of Maine with an additional 711

[7] Washington State banned commercial net-pen aquaculture on state-owned aquatic lands in November of 2022, but is currently facing legal challenges regarding its denial of lease renewal applications. The future of net-pen farming in the state is uncertain at this time.

Limited Purpose Aquaculture licenses (Britsch et al., 2021). Limited Purpose Licenses "allow small-scale operators to farm up to 400 ft^2 (37.2 m^2); these farms can be used to grow selected shellfish species and seaweed but not finfish" (Britsch et al., 2021, p. 2). Aquaculture development is listed as a strong priority in Maine's 2020 Economic Development Strategy[8], and the sector is "poised to grow significantly in the next few years" (Bristch et al., 2021, p. 2).

AQUACULTURE CONFLICT IN MAINE

Aquaculture in Maine holds multiple levels of conflict due to differing regional histories and geographies. Maine is experiencing a postproductive transition (Hanes, 2018): a "decline in raw-material extraction and commodity production in rural areas… often accompanied by amenity-consumption land uses, such as tourism and second homes" (Hanes, 2018, p. 186). This creates competing visions of place between long-term residents and "amenity migrants" (Hanes, 2018, p. 187), especially in regard to coastal and nearshore use. Coastal residents and landowners often express concerns over waterfront access, citing Maine's aquaculture laws which guarantee "public use and enjoyment" (Hanes, 2018, p. 193) of waters within 1,000 feet of a landowner's property or common uses of a site by the public. This criterion is often left open to interpretation, and the Maine Department of Marine Resources (DMR) has not yet rejected an aquaculture site lease application based on this consideration, though residents often cite it when expressing concerns over new lease applications (Hanes, 2018).

Another level of aquaculture conflict in Maine has to do with its tensions with wild-catch fisheries. Aquaculture growth is occurring at the same time as a variable Maine commercial

[8] For the most up-to-date economic development plan for the State of Maine, see the Department of Economic and Community Development's website at https://www.maine.gov/decd/strategic-plan.

fisheries catch yield, with historic fisheries highs in 2021 (DMR, 2023b) followed by the lowest lobster haul in a decade in 2022 (Ogrysko, 2023). There is also a perceived decline in the number of fishermen actively "on the job" in Maine (Gurney et al., 2022). The decline in what is referred to as Maine's "heritage fisheries" is seen as a loss of iconic working waterfronts and a blow to the state's diverse marine economy (Gurney et al., 2022). Fishermen report feeling their vocation is becoming more difficult due to a lack of access to working waterfronts, permits, and leases, economic hardships, and infrastructure decline, while feeling that both in- and out-of-state funding is being dedicated to supporting the growing aquaculture sector rather than their needs (Gurney et al., 2022). At the same time, while many groups in Maine are dedicated to preserving the state's fisheries, many fishermen believe the industry's future is uncertain and discourage youth from entering due to its instability (Gurney et al., 2022). All of these factors have contributed to aquaculture becoming unintentionally caught in the cross-hairs of a larger drama representing the future of Maine's wild-catch fisheries and greater working waterfronts.

Net-pen Salmon Aquaculture

"Net pen aquaculture" refers to a specific type of aquaculture which utilizes pens made of mesh netting submerged in the ocean to raise fish (Naylor et al., 2021). In Maine, net pen farms are used by Cooke Aquaculture to raise Atlantic salmon (*Salmo salar*). Salmon aquaculture in Maine has a contentious history, characterized most recently by the investigation by the Maine Department of Environmental Protection into Cooke Aquaculture's 'mass die-off' of over 100,000 salmon in their open net pens near Black Island, ME (Stockford, 2021). After 2025, Maine will be the only state in the U.S. which permits the use of open net pens (Stockford, 2021). Net-pen salmon aquaculture has generated controversy in areas outside of Maine as well, with communities citing concerns over competition with traditional fisheries and potential health

and environmental risks associated with chemical treatments for fish disease (Fry et al., 2018; Walters, 2007). Other documented impacts such as marine pollution and social conflict contribute to community opposition to salmon aquaculture specifically (Johnson & Rickard, 2022; Rickard et al., 2022; Walters, 2007). Perceptions of a *closed* net pen aquaculture facility, the type proposed by American Aquafarms in Frenchman Bay, are as yet undocumented due to the novelty of the technology.

Closed net pen systems

In a closed net-pen system, a barrier is used to control interactions between the fish inside the pen and the outside environment, eschewing the traditional open mesh netting for a more contained, solid barrier between fish and the surrounding waters (American Aquafarms, 2022). American Aquafarms promotes its closed net-pen technology as "clean [and] low-profile" with "no antibiotics, no escapes, no parasites, no predators," offering the ability to "control almost all waste from reaching the ocean" (American Aquafarms, 2022). These differences from traditional open net-pen farming may have an impact on community perception, as perceived controllability and trust in the process of science (i.e., technological advances) have both shown to be factors which create support for "novel" aquaculture technologies (Johnson & Rickard, 2022; Rickard et al., 2022; Rickard et al., 2020). To my knowledge, the impact of sense of place on community acceptance of proposed net-pen aquaculture projects has not been studied.

Methodology of previous studies

Many previous SoP studies have used quantitative survey methods. For example, Carlisle et al. (2014) utilized phone interviews with randomly selected participants based on geographic address, while Lewicka (2005) and Schafer et al. (2010) used mail surveys, identifying stakeholders in a similar fashion. For Carlisle et al. (2014), $N = 594$, for Lewicka (2005) $N =$

1328, and for Schafer et al. (2010) $N = 335$, representing a large response rate and the ability to generate significant data and results. However, these surveys represented a "snapshot" of a moment in time and required stakeholders to pick up a phone or mail survey and dedicate time to answering the questions in detail. The time and resources demanded by these types of surveys may not be accessible or possible for all stakeholders. These surveys are also expensive to conduct if the researcher wishes to gather a representative sample.

Joyce and Satterfield (2010) conducted in-depth, in-person interviews with coastal stakeholders over two years and across five study sites, and Bergquist et al. (2020) used semi-structured interviews with stakeholders identified via snowball sampling to identify themes and other relevant issues associated with SoP. Snowball sampling operates by identifying initial contacts and utilizing those contacts to identify other relevant interviewees, which allows for the researcher to build a network of relevant stakeholders and individuals who may be otherwise difficult to connect with or reach (Creswell, 2014; Lindlof & Taylor, 2011). This methodology requires more time on the part of the researcher in conducting and transcribing interviews; however, qualitative interviews allow for a more nuanced, comprehensive analysis of emergent themes within a specific sample, posing different strengths than a quantitative approach, which, depending on the sample, can offer more generalizable results (Bergquist et al., 2020; Joyce & Satterfield, 2010). Qualitative interviews were chosen for this research for a number of reasons. Firstly, Frenchman Bay and its surrounding communities are unique in their culture, customs, and history, making results from this research specific to the area due to contextual factors. Second, the level of detail sought in response to the research questions fit a qualitative, rather than quantitative, approach: results which were nuanced and provided a holistic understanding of intertwined issues, from the interviewees' perspective, was desired. Qualitative interviews also

allowed for exploration and discovery of emergent themes around the proposed fish farm which may not become apparent using quantitative methods.

RESEARCH QUESTIONS

Based on the above literature review, it is clear that place attachments and identities, as their own theories derived from SoP, have impacts on individual and community level responses to proposed project development that goes beyond NIMBY. The emerging concept of climax thinking has further implications, building on SoP to create a new understanding of community resistance to proposed change. Within aquaculture, rapid growth and increasing global demands are seeing an increase in proposed development projects and a rise in community-industry tensions. In Frenchman Bay, Maine, an Atlantic salmon closed net-pen farm proposed by American Aquafarms has seen a unified community opposition to the development. Based on the reviewed literature and the background context of aquaculture tensions in Maine, this led to the following research questions.

RQ1: What (if any) risks or benefits do stakeholders associate with the proposed Frenchman Bay aquaculture project?

1a.) Broadly, how does sense of place impact willingness to accept environmental risk?

1b.) How does sense of place impact community acceptance/rejection of the proposed Frenchman Bay aquaculture project?

RQ2: What is the salience of Frenchman Bay to stakeholders, and what values and meanings do they attach to it?

2a.) What terms do stakeholders use to describe relationships with and values and meanings of Frenchman Bay?

CHAPTER 3
METHODS

GROUNDED THEORY

This research utilizes grounded theory, one of the most widely used models of qualitative research. In grounded theory, categories (themes) are developed from the researcher's firsthand experience with the evidence and field settings, "grounded in" relationships between the data and the categories they are coded into (Glaser & Strauss, 1967). Categories develop through a process known as the constant-comparative method, in which units of data are continually compared with each other (Lindlof & Taylor, 2011). New data alters "the scope and terms of the analytic framework" (Lindlof & Taylor, 2011, p. 250) while the researcher is still in the field, and codes, categories, and definitions continue to change dynamically. This particular project utilized open coding, in which the data analyst(s) reviewed the interview transcripts line by line and coded the data into categories which were simultaneously being "built, named, and hav[ing] attributes ascribed to them" (Lindlof & Taylor, 2011, p. 251). The focus is on 'opening up' the line of inquiry, while exactly how the categories relate to one another is determined later on in the research process, through comparing the emergent themes and through subsequent rounds of coding, each round illuminating further insights (Lindlof and Taylor, 2011). This work utilized two cycles of coding in Dedoose, the first with an undergraduate research assistant and the second with just the primary researcher (myself). In first cycle coding, the two coders used elemental methods, "basic but focused filters for reviewing the corpus and [building] a foundation for future coding cycles" (Saldaña, 2013, p. 83). These first cycle categories were derived from the interviews by both coders, providing a basic framework for initial emergent themes. In the second cycle of coding, the researcher used insights from first cycle coding to develop further thematic organization which allowed for a "coherent metasynthesis" (Saldaña,

2013, p. 207) of the data, “connecting the dots” between themes to paint a more holistic picture of interconnectedness of the data.

EPISTEMOLOGICAL, ONTOLOGICAL, AND ETHICAL ORIENTATIONS

This research was carried out within a blend of critical and postpositivist research practices intended to encourage the researcher to personally reflect and realign with their own reality. Research questions were approached with the idea that the researcher’s understanding of the world is influenced by their privilege and power. This is in line with the critical paradigm, which highlights that historically and socially constructed power relations influence our understanding of phenomena (Lindlof & Taylor, 2011). This is similar to a transformative approach, which “holds that research inquiry needs to be intertwined with politics and a political change agenda” (Creswell, 2014, p. 9). While a critical approach dictates that one must be *aware* of power dynamics, the transformative approach asks that one *use* this knowledge to confront social oppression (Creswell, 2014). When designing research questions, the researcher must ask what power they hold within a community and how it can be used to uplift traditionally marginalized voices. The Frenchman Bay research was conducted under an implicit understanding that reality is influenced by positionality — in short, there are multiple realities. This used both the critical and postpositivist approaches to check personal power as a researcher and ensure that the created study did not harm the Bar Harbor and Gouldsboro communities. For the purposes of this study, this included approaching identified potential interviewees with respect for their positions and community knowledge. Community leaders such as extension agents, university professors, and town managers were consulted at early stages of this research, as the issue to be researched was clearly sensitive, and insight into best practices for working with community was desired. Those early conversations shaped how the research proceeded and

how interviews were conducted. Interviewees knew their information, should they accept an interview request, would be made confidential and would not harm their community standing or be released directly to the community in a way which could be interpreted as harmful.

One aspect of this research's ontological orientations was how I as a researcher presented myself to my interviewees. The subject matter I was inquiring about was sensitive, and I had no desire to been seen as "stirring things up"; however, I wanted to ask probing questions about the American Aquafarms project. In order to assure interviewees I was genuinely interested in the unfolding situation with no intent to cause any harm, I purposefully chose to present myself as a student, eager to learn. I emphasized my position as a graduate student, explaining that I viewed the proposed farm as a source of knowledge regarding coastal change in Maine, a case study for many other projects along the coast. I also revealed my own personal connections to Frenchman Bay in hopes of establishing myself as more than just a student "from Away," explaining that I have been visiting Mount Desert Island every summer for my entire life, and that my parents owned a home in Bass Harbor on the island. I was able to identify local landmarks and reference local institutions and businesses. At the same time, I was careful *not* to identify myself as a local; I made it clear I was "from Away" and was familiar with the place, but was careful not to lay claim to it. This was purposefully done due to the contentious nature of identity labels in Maine; I did not wish to upset my interviewees with my self-identification.

This research was conducted under the assumption that the role of the researcher is to discover knowledge which can be applied as a force for positive change. This is a postpositivist approach; the postpositivist view follows the premise that the discovery of phenomena is "equally valued as logics of research" (Lindlof & Taylor, 2011, p. 7) and that a scientific

approach to understanding and explaining social phenomena is a valuable method of inquiry. It was my hope that this research would provide insight and further understanding into what creates barriers to change in coastal Maine communities and why communities resist may change. I wanted an idea of what communities wanted for their towns' futures, and how they hoped to achieve those goals. These insights were to come from research participants and their interview responses, as well as my own holistic view of the research, combining background literature and contextual clues with interview data. This is why a blend of the critical and positivist was used in this research, as well as the following ethical obligations, derived from Lindlof and Taylor (2011) and self-determined ethical practices: research must 1) do no harm to people or environment, 2) use voice and power for good, and 3) shun entitlement. In order to do "good" for the community, the results of this research were always intended to be shared back with interviewees, who hold positions of management authority within their communities. This aims to be transformative in providing the uncovered insights directly to community managers and decision makers, who could use these findings as a means of further insight into their communities' desires, obstacles to those desires, and how realistic meeting those desires is, as well as to inform their management decisions.

METHODS

This study investigated sense of place and community acceptance/rejection of change associated with aquaculture in Frenchman Bay, Maine. Research was conducted by identifying relevant stakeholders within a) the towns of Gouldsboro and Bar Harbor local governments, b) officials and staff at Acadia National Park, and c) members of local advocacy groups. These stakeholders were chosen from a wide range of possible groups due to close involvement with the permitting process, stated interest in the future of the fish farm, as evidenced by their

frequent mention in early media coverage of the case (Bever, 2021), and their accessibility, which was pertinent to a two-year MA timeline. Stakeholders were identified via Internet searches, snowball sampling, and through early consultations with community leaders. An initial list of potential interviewees was generated through searching town, park, and advocacy group websites for individuals with titles such as Superintendent, Deputy Superintendent, Chief of Administration, Town Council Member, Town Manager, Harbormaster, Selectman, President, or Volunteer and whom also had publicly available email addresses. Once potential interviewees were identified, they were sent a recruitment email with a request for an interview and brief description of the project (Appendix B) and a consent form (Appendix C). A follow-up email was sent if there was no response within 1 week. Following interviews, interviewees were asked if they knew of other individuals who belonged to relevant stakeholder groups who should be interviewed as well. Those suggested interviewees were contacted using a snowball sampling recruitment email (Appendix D).

The interview period occurred from July to October of 2022 following IRB approval. Once interviewees responded and agreed to the interview request, a date and time at a location of the interviewee's choice was established. Interviews took place over Zoom or at the chosen location, following COVID-19 protocols in place at the time. Interviewees were introduced to the researcher, the research project, and a review of the consent form. After responding to any potential questions, interviewees were asked a series of questions in a semi-structured interview format which reviewed knowledge of aquaculture, values associated with Frenchman Bay, and potential risks and benefits of the proposed American Aquafarms project (Appendix A). With two exceptions who clearly stated when they were responding as town managers versus as community members, all interviewees responded to questions from their dual perspectives as

decision makers and residents. With permission, interviews were audio recorded. Fifteen interviews were conducted, resulting in sixteen audio recordings and one note sheet. There were 532 minutes of recorded interviews. It is estimated the unrecorded interview lasted 20 minutes. This results in a total of 552 minutes, or 9.2 hours, of interviews. Recorded interviews ranged from 22 to 55 minutes (M = 36.8 minutes). Of the fifteen interviewees, three were Acadia National Park officials, four were advocacy group members, and eight were town managers in Bar Harbor or Gouldsboro.

Once the interview period concluded, interview audio files were uploaded into the transcription platform Descript. Potential identity identifiers were removed from file names. Descript used its AI transcription service to produce text transcripts of interviews, which were then reviewed and edited for accuracy, clarity, and confidentiality by the researcher and an undergraduate research assistant. Individual transcripts were shared back with interviewees in January 2023 to ensure interviewees felt their responses were accurately recorded; light editing of transcripts occurred when interviewees asked for items to be omitted due to potential information sensitivity. Transcripts were then uploaded into the qualitative coding platform Dedoose, where the researcher and assistant performed an initial first cycle coding of the interviews. Codes were derived from reviewed literature and the semi-structured interview protocol, searching for the beginnings of patterns or themes which seemed relevant to the research with "meticulous attention to language and deep reflection on the emergent patterns and meanings of human experience" (Saldaña, 2013, p. 10) in regards to the proposed fish farm. Following the first cycle of coding, codes and excerpts were reviewed and codes were updated or

created to better capture the nuance of interview details. Codebook updates were followed by a second, final coding cycle carried out by the researcher.

There were 10 initial parent codes (Table 1) and 13 child code 1s (Appendix E). After the first cycle of coding, an additional two child code 1s and three child code 2s were added (Appendix E; highlighted) for a total of 28 codes.

Table 1. Parent codes in qualitative coding of the Frenchman Bay stakeholder interviews. For a fully expanded table, see Appendix E.

Code	**Count**
AquaType	41
Community	281
EnvRisk	56
Good Quotes	55
LicensingProc	106
Media	34
OtherMarineTension	82
Scale	119
SoP	221
Trust	36

The first cycle of coding occurred from November to December 2022, with two coders (researcher and undergraduate research assistant). Second cycle coding was conducted from January to mid-February 2023 with one coder (researcher).

The only barriers to conducting this research were interviewee recruitment and Internet outages for Zoom interviews. 27 potential interviewees were emailed with the recruitment or snowball sampling recruitment email; of those 27, 15 agreed to be interviewed. Only one person outright declined to be interviewed, citing concerns over the contentiousness of the subject matter; the other emailed participants did not respond. One individual agreed to an interview but did not attend; upon rescheduling they did not attend the second time. One interviewee agreed to an interview with the request they not be audio recorded. With their permission, the researcher took handwritten notes. Those notes were transcribed onto a secure laptop, uploaded into Dedoose, and treated as an interview transcript for the purpose of coding. Due to Internet outages, two interviews held on Zoom were broken up into two separate audio recordings; these were transcribed by Descript and uploaded into Dedoose labeled as “part 1” and “part 2” of those interviews.

CHAPTER 4: RESULTS AND DISCUSSION

CONTEXT AND ROADMAP

The research questions explored risks and benefits stakeholders associated with the proposed Frenchman Bay project, their sense of place in regards to Frenchman Bay, and what values and meanings they attached to the bay. In order to respond to the research questions and keep the research findings contextualized, the results and discussion will be organized by discussing the five major overarching themes which emerged from the collected data, under the umbrella of scale: community change, sense of place and prominent values, licensing process concerns, and other adjacent and relevant marine tensions. Many of the themes are intertwined with other community change items. In this work, themes differentiate from codes by linking together multiple ideas and creating a higher, more abstract level of thinking as opposed to the simple ideas that codes represent. Scale is a clearly overarching theme, encompassing environmental risk, licensing process, and recreation access concerns, as well as concerns over impacts on community character. Sense of place is intertwined with history, aesthetics, and community, and often all four occur at once. Together, they create high criteria for any potentially disruptive project to gain social acceptance. Perceived community benefits are overwhelmed by scale and environmental concerns, and held to a rigorous standard when compared with perceived project drawbacks and risk perceptions. Drawbacks and risks are less thoroughly vetted than potential benefits, but hold stronger sway over project acceptance or rejection. Underneath all of this, tensions simmer regarding decision-making power: who holds it, how it is applied and enforced, and how it may need to change hands.

Overwhelmingly, this research points to the idea that the Bar Harbor and Gouldsboro stakeholders have a strong connection to place and an idea of what fits into their community

identity, and what does not. Their strong sense of place is built on values prioritizing landscape aesthetics, access to recreation in "natural" spaces, strong community ties, and personal identity connections to Frenchman Bay, such as family histories. Ideas of what fits into their communities – namely, small, local businesses owned and operated by active community members, an open viewscape, and autonomy in management decisions – are impacted by those values. When a project which would occur on a large and very visible scale was proposed, with little community outreach, stakeholders felt their identity challenged and disrespected.

RESULTS AND DISCUSSION

Seventeen transcripts representing approximately 9.2 hours of interviews were coded. After two cycles of coding, there were 29 total codes (Table 1) and 1,031 code applications across 523 coded excerpts. The three most frequently applied codes were Community, SoP, and Scale.

OVERARCHING THEMES

The major themes which emerged in stakeholder interviews were community, sense of place, licensing process, and other marine tensions, all of which occurred under the umbrella of scale. It was anticipated that environmental risk would emerge as a prevalent theme based on reviewed literature (Fry et al., 2018; Johnson & Rickard, 2022; Rickard et al., 2022), which prompted RQ1, but this idea emerged in tandem with concerns over the impacts of project scale, which was unexpected. That is, interviewees suggested that larger scale was associated with greater perceived environmental risk. Discussion of the most prevalent themes, as well as which themes were co-occurrent, occurs in the following section.

SCALE

"It just didn't work. I think that the scale of the project was so counter to the history of the place and people care so deeply about that place that [American Aquafarms] couldn't win. They couldn't win the public over."

-ANP official

One of the biggest reasons interviewees cited for their opposition to the proposed American Aquafarms project was scale, which was the third-most applied parent code (119 applications in 14 out of 15 interviews) and which referenced both physical size and assumed impact of size. American Aquafarms proposed 2 60-acre sites on Frenchman Bay, a scale which stood out against Maine's traditional 4-acre leases. This is distinct for Maine; as one advocacy group member noted, when out to a lunch with Canadian Maritime Ministers, one of the ministers asked,

> … 'What's the deal with four acres? Who has a four-acre farm?' I was like, 'is there more substantial farms? Like four acres or bigger?' And I think he actually slapped himself on the forehead and [said] 'Our leases start at 15 acres. [Our] average farm is 30 acres. Four-acre farms? That's a joke. That's not even a hobby farm by our standards.' (Advocacy Group member)

Maine having different scale baselines was clear in interviews; there were more code applications for "large scale" than "small scale," though many mentions of scale mentioned both large- and small-scale operations. Scale and "large scale" often co-occurred (n = 31), as did Scale and "small scale" (n = 20), showing that scale and size were often mentioned together and one was considered important for contextualizing the other. Stakeholders were concerned about the impact a "large-scale" farm could have on the ecology of Frenchman Bay and its recreation and fishing activities. Additionally, stakeholders were worried that pollution from support barges, or runoff from the salmon pens themselves, would impact the water quality and ecological health of the bay; they also worried the American Aquafarms pens would take up a

disproportionate amount of space compared to other activities. As one town manager explained, "Everybody has to be respectful. That includes small business, big business, individuals…. And by respectful what I mean is that everybody needs to take account of the impact they are having [and] how it's going to affect everybody [else]." In this case, domination of the visual landscape was an issue for stakeholders and contributed to project opposition. "If we just start plopping aquaculture out here, [Frenchman Bay] will fill up… There's some limit," a town manager explained. Stakeholders felt that visually and activity wise, Frenchman Bay should remain relatively "empty" to preserve a sense of naturalness, which raised concerns with a large-scale project. For interviewees, "natural" seemed to mean a combination of a land- or sea- scape which was untouched or minimally visually impacted by human presence, seen as in harmony with existing nature, as found in Rickard et al. (2022b).

Stakeholders mentioned support for small-scale farms, which they saw as more local, more sustainable, and having a smaller environmental impact. "A vast majority [of people expanding their aquaculture business] are not really increasing their footprint, or if they are, they're going from something very small to still something very small," an advocacy group member explained. Interviewees mentioned knowing there is already aquaculture activity in Frenchman Bay, but the distinction between type of aquaculture and size was important. Salmon farming was viewed as visually disruptive, while shellfish or seaweed aquaculture was simply "buoys in the corners" of the lease sites that "you can't see" (Town Manager), which aligned with previous research on visual preferences and aquaculture which suggests that how visible a farm is impacts aesthetic concerns (Hanes, 2018). Finfish aquaculture was described as "a different flavor" than "owner operator, small scale, primary consumer level aquaculture" (Advocacy Group member) such as seaweed, oysters, or mussels. Small-scale aquaculture was

viewed as more connected to the community, especially because the owners and operators of those sites were well-known as friends, family, and active citizens. As a Town Manager stated:

> I think the fact that they're local people and that they know the place and they're committed to the place, and they see a connection between the stewardship of the place and their business and that they've come to town council, they're on [local committees], and they're participating in management. There's huge benefits. They have a different perspective and they're creating value and money and economy and even ecological value of adding primary consumers into the space.

Community involvement garnered community support, and perceptions of aquaculture type came into play when determining the level of community acceptance as well. Scale was closely tied to type of aquaculture and community involvement, which was something interviewees felt American Aquafarms did not have: "I mean, their community engagement sucks," one advocacy member said bluntly. Interviewees viewed community involvement as being active and engaged in the community, attending town meetings, supporting committees, and being seen and spoken to in physical community locations, i.e. the library or coffee shops. This is supported by Whitmore et al. (2022), which highlights the importance of place-based experiences in building and contributing to trust. Trust, which dealt with mentions of trust including dis/trust of American Aquafarms, was one of the least applied codes, which was surprising. Interviewees mentioned their communities, environmental risk perceptions, and reasons for rejection the proposed fish farm abundantly, but did not specifically mention trust or why they dis/trusted the incoming company. Trust could, however, be related to feeling involved in the siting and permitting process (Rickard et al., 2022b; Whitmore et al., 2022): interviewees mentioned that community members felt left out of the conversation by American Aquafarms, who did not attempt to engage with the community, and when they did present on their project, presented "stock items" that were essentially PR, failing to address community concerns. Stakeholders

found this frustrating, and as a further example that American Aquafarms did not understand their community character or visions for the future. When asked about public meetings with American Aquafarms, stakeholders replied by pointing out specific moments which left them feeling unengaged:

> …They had this slideshow, it was like, 'Right place, right time, right people.' And basically, it felt to me like they looked through a map of the East Coast, and they were like, 'Okay, where's there a bay that's deep enough or cold enough without anything else in it?' They basically circled some spaces on the charts and were like, 'Okay, no, not this one, not that one… how about this one?' Their 'right place' was about water temperature and depth and flow. And I was like, you guys are so far away from where you want to be… (Town Manager)

> They did these public presentations and people told them, 'We don't think your data's good.' And they explained why they thought it was good. I mean, it just sort of came down to a difference of opinion on the science perhaps. (Acadia National Park Official)

> [There was a scoping session], where the way [American Aquafarms] set up the Zoom didn't enable people to see if there were two of us on the Zoom or 250 of us on the Zoom. So it was really not transparent from that perspective… they were saying publicly, 'We had 200 people show up,' and everybody was like, 'We had no idea,' because they didn't let people see that. And they would only allow a certain number of questions…. So people couldn't see, 'Wait, am I the only one who still has a question? Or are there still actually 22 people who have questions, but they're ending it because time is up?' (Advocacy Group Member)

Stakeholders cited a lack of transparency in American Aquafarms' public feedback sessions, in addition to time restraints which failed to allow for adequate community feedback and which felt structured in a non-inclusive way.

Community

"I think it's a number of factors, but for whatever one affects you, whether you're a shorefront property owner and you don't wanna see it, whether you're a fisherman and you don't want them in your gear, the end result is you don't want it. And that's what people agree on."

-Town Manager

Community was the most prevalent theme across all interviews; the Community code was applied to over half of all excerpts, with 281 counts across the 523 total coded excerpts. Interviewees mentioned the entangled nature of their communities: most stakeholders mentioned people in their communities wore "many hats," from part-time lobsterman to policeperson to professor to town board member, and thus had varied concerns regarding their communities and change. Bar Harbor and Gouldsboro have long histories of marine and coastal use, but are currently facing a rise in tourism and higher cost of living as real estate prices rise. As real estate costs rise, residency is impacted. In the two towns examined, there are full-time residents making their living on the water fishing, in the tourism industry, or through other means and there are part-time residents who come to the area seasonally in the summer and for part of the "shoulder seasons" of spring and fall (Bever, 2022; Bever, 2021; Gurney et al., 2022). These distinctions – of being "from Maine" and "from away" – create points of contention in the community. Several stakeholders, including town managers who had been living in their communities for a considerable amount of their lives, mentioned that divide. As one advocacy member mentioned, "Technically I moved here. I've been here over half my life now… I consider myself from Maine, but I know I will never be a Mainer." Being considered "from Maine" grants community members stronger sense of identity with their communities, and a stronger sense of feeling they know what is right for their communities. Stakeholders showed high respect and value for the opinions of others in their community they considered "true Mainers." This could be aligned with SoP findings on place attachment and identity, which have shown that more time spent in a place heightens SoP and attachments (Devine-Wright, 2009; Devine-Wright & Batel, 2017; Lewicka, 2005); it could be possible that certain individuals are known to have lived in a place

longer, are recognized as having higher place attachments, and thus are seen by their community as having more authority over a place than those who have not lived there as long.

One of the main findings that arose from interviews was the unified community rejection of the proposed American Aquafarms project. Within the "Community" code, the child code for "Rejection" was used the most, with 97 code applications, and "Community" and "Rejection" were the most co-occurrent codes out of all excerpts, with 73 co-occurrences. As one stakeholder said,

> …In the 30 plus years that I have lived here and been very closely connected to the ocean, whether it's in my [work] world or in my being on the [water] kind of world, I've never encountered an issue that triggered such a locally unified opposition.

The proposed project brought together individuals from all walks of life, from lobstermen to wealthy summer residents, and even individuals who identified as anti-environmentalists. Interviewees mentioned being politically liberal, but feeling allied with others they might not usually be: "[A local] got super involved, he went to the Sierra Club meeting, which I almost fell over laughing when I heard that because he's got like Trump stickers on his truck" (Town Manager) or vice versa: "Like I said. I'm not a tree hugger. I'm not. But you still have to look at how [the American Aquafarms project is] going to have an effect on everything and everybody" (Town Manager). This may be an example of climax thinking, with the existing community social infrastructure strengthening shared ideas of ideal landscape use which simultaneously reject change to that use. The American Aquafarms project brought together stakeholders across fields, backgrounds, and political leanings, bringing groups who may typically be opposed together and lending community resistance significant strength. Their reasons for rejection were also relatively unified, further strengthening community ties.

Stakeholders mentioned that their rejection of the proposed project, and the rejection of other community members, had to do with environmental concerns, the unproven technology of closed net-pen farming, and not wanting to see the physical structures of the proposed farm. Most interviewees mentioned the same "surface-level" concerns, including being unsure about nutrient runoff from the fish farm into the bay, particularly nitrogen, and their concerns over increased barge traffic in the bay, which could bring more pollution or even a fuel spill if a tank burst. Stakeholders were also concerned about the state government's historical ability to monitor other salmon aquaculture sites in Maine, citing past changes which have led to a feeling of inadequacy in current management and monitoring.

> There used to be a pretty good salmon monitoring program where twice a year, divers went under the pens and looked to see about organic buildup, which is the first indicator of organic loading… it was very quick and you could detect what was going on very quickly in the process. …nobody's looked under a [salmon] pen in, I don't know, eight or ten years since DEP took over the permit. (Advocacy Group member)

As closed net-pen farming is a relatively new technology, they expressed apprehension over if it would actually mitigate fish escapes or disease as American Aquafarms claimed it would, and wondered if it would actually have a reduced environmental footprint compared to traditional net-pen farming. Physical structures were a large concern for stakeholders: the project would impact the viewshed heavily, be placed on roughly 120 acres, and would be visible from the top of Cadillac Mountain.

Stakeholders also expressed sentiments that the project would not bring community benefits, something that needed to be considered in a pros-and-cons type of comparison and which has been explored in other aquaculture perception research (Rickard et al., 2022). As one Town Manager explained,

> …Right out of the gate, not knowing much about it, I said gee, it sounds like something that might be good for the area. And that I would like to see something like that, something that would bring in jobs… before, when it was [another business]… they had a hundred and some odd people working there… so there was a tax, there was more road traffic… but that was great for our community. More of a benefit than a negative and you're in good shape. I think in this case, I don't see it that hard. (Town Manager)

The potential risks of runoff, environmental issues, and visual disruption did not outweigh potential benefits, such as job creation. Other interviewees mentioned that community rejection may have to do with a sense of powerlessness on the part of the communities involved: as one town manager explained,

> None of the towns can actually do anything about it. It's because it's at the state level. The state level has limited resources or limited policies or rules or laws to prevent a process from happening. So, there's this growing concern or frustration with government because nobody feels – locally, nobody feels they have control. They perceive they might, but they really can't do anything about it. (Town Manager)

The permitting process for aquaculture was mentioned frequently in interviews, as was the perception that the Maine Department of Marine Resources (DMR) was underfunded, overstretched, and operating on outdated regulations which had not been created to manage large-scale (over 4 acres) aquaculture projects.

Sense of Place

"…the clear feature that distinguishes us in this area is that there is a national park that covers about two thirds of the island… So it's really an integral part of our community. It's not a remote park that's way down some access road. It's right here and part of our lives and Frenchman Bay is a beautiful bay that is populated by fishing boats, lobstermen, and a lot of small islands. And so the landscape, it's not just open ocean, it's a lot to look at. And what you do see up there for human activity is activity that's taking advantage of that resource, which is fishing."

-Town Manager

Interviewees expressed strong aesthetic, historical, and recreation-based attachments to the Frenchman Bay area, in line with previous SoP literature (Lewicka, 2005; Devine-Wright &

Batel, 2017). It was anticipated the SoP code would be heavily applied, but it was the second most applied code (221 applications). Within Sense of Place (SoP), the most applied child code was Aesthetic, followed by History, and then a tie between Identity and Recreation. For code co-occurrence, SoP and History co-occurred the most (27 co-occurrences), followed by SoP and Aesthetics (24 co-occurrences). SoP and Community co-occurred somewhat (22 co-occurrences). These co-occurrences show themes generated by code co-application, helping to understand what items worked together to create interviewees' sense of place and contribute to a higher-level understanding of which values shaped stakeholder sense of place salience. Aesthetics were mentioned frequently when interviewees were asked to describe what they liked about the bay: a plethora of "natural" (to stakeholders, untouched or minimally impacted by human activity) looking landscape, recreation opportunities, and traditional use of the water (small-scale, independently operated fishing enterprises, such as lobster boats) contributed to what they liked to see, as well as proximity to Acadia National Park. There was an overall perception that there was not much industry in the bay, and that the landscape was well-preserved and "natural" in appearance, i.e. no visible man-made structures beyond the lobster boats or pleasure craft that could be seen.

Aesthetic mentions were closely tied to reasons for rejection of the American Aquafarms project. When describing what they found attractive aesthetically about Frenchman Bay, many stakeholders used that to explain why they did not want the salmon farm. For example, one town manager said:

> There's the broader issue usually represented by the comment of 'we don't want to industrialize the bay.' …when you look [out] you see half a dozen boats, but you don't see 500 boats right out there. So the visibility of activity in the natural environment and the potential for contamination are probably the two biggest factors in terms of seeing

> this like a negative. I'm interested in this whole tagline of industrialization of the bay, because I'm not a hundred percent sure I understand all that means. I think it means both of those, contamination and visual stuff combined. It sounds terrible… you take a bay that has looked like it does now, with the exception of cruise ships, for quite a long time, is it really wise to change that environmental viewscape? (Town Manager)

Interestingly, the idea of what the bay has looked like for "a long time" (Town Manager, above) may be akin to climax thinking, supporting the recent historical and visual character of the bay as the ideal, or climax, state (Sherren, 2020). The proposed fish farm would interrupt the visual appeal of Frenchman Bay, going so far as to be visible but from the summit of Acadia National Park's iconic Cadillac Mountain. The seemingly "empty" space of Frenchman Bay, and how it seems open and lightly used, is visually appealing to stakeholders and residents, and a key part of why they enjoy spending their time on and around the Bay.

Many interviewees mentioned the history of Frenchman Bay when asked about their sense of place. Some mentioned their personal histories: how long they had been visiting, when they moved to the area or how long they had lived there, if they had grown up by the water, and how their families or partners played a role in why the place felt impactful to them. "Frenchman Bay is where I literally got my feet wet in connecting to the waters [of] the entire Gulf of Maine," one Advocacy Group member explained. The historical aspects of Frenchman Bay, Bar Harbor and Gouldsboro were mentioned as well. References to the history of the tourism industry and how it began with visitors attracted to the natural view were made alongside mentions of the working waterfront, and how lobstering, cod, and other groundfish have fisheries history in the bay. Aquaculture was also mentioned, though specifically referenced as "small scale," with kelp and shellfish farms being owned and operated by individual families on plots of

4 acres or less[9]. Overall, mentions of place history were typically accompanied by references to how the place had changed over time, becoming more focused on tourism and recreation:

> In the desire to create a shoulder season that supported more businesses and more people to come and live here, cruise ships became part of the formula and they started back in the late seventies, early eighties, and [with] advertising the shoulder season blossomed to from May first until the end of October. (Town Manager)

and less focused on fisheries or working waterfront. The shift to tourism and recreation was seen as simultaneously good and bad; stakeholders wanted their town economies to be supported, but lamented the overcrowding of shared resources, especially in regards to cruise ships, suggesting a nostalgic consideration of the past when there was a "balance" in tourism. Historical mentions emphasized the attraction of the place's natural beauty, alongside being able to experience 'nature.'

A major part of interviewees' associations with Frenchman Bay was recreation. Many referred to nearby Acadia National Park and how it provides trail and boating access for locals and visitors. In addition, use of Frenchman Bay for ocean kayaking, pleasure boating, or other coastal recreation, i.e. walking along the beach, was mentioned. Access to the ocean, and the area being a resource for recreation and fishing, was mentioned often as a key benefit to the area, with one interviewee mentioning "the geography, the mountains by the sea [combination]" (Advocacy Member). This supports and builds on previous SoP and communication literature, such as Rickard and Stedman (2015) which discusses how recreation meaning is not determined solely by the activity taking place, but also the significance of *where* the activity takes place. Interestingly, when interviewees mentioned fishing, they mentioned *watching* fishing, such as

[9] "Experimental," or limited purpose, aquaculture lease applications, also known as LPAs, are limited to four acres or less by the DMR. Standard leases can cover up to 100 acres.

the presence of lobster boats, not actually fishing themselves. It was the idea that *someone* was fishing which was considered attractive; it did not necessarily have to be the individual being interviewed. The "working waterfront" was a key piece of place identity for stakeholders; they saw it as integral to the character of their communities. This could be due to the long history of a maritime economy on the Maine coast, the visual character that a working waterfront affords a town, or even tie back to the idea of who a "Mainer" is, emphasizing hard work and community ties.

Licensing Processes and Other Marine Tension

> "This is the time when the Department [of Marine Resources] can hit pause and say, 'We really need to revise the regulations to manage something that's so big.'… [their] original intent was they were going to dive on every finfish site once a year… They don't have the money, they don't have the personnel. They're not doing that anymore. And that kind of thing would be essential for a project of this scope. But they don't have the resources or personnel to do this."
>
> -Town Manager

A major and unexpected finding which was a clear emergent theme from stakeholder interviews was discontent with the aquaculture lease permitting process and current Maine Department of Marine Resource (DMR) aquaculture regulations. The prevalence of concerns regarding the lease permitting process was surprising as the interview questions were focused on sense of place, and aquaculture regulations were not specifically mentioned. However, "LicensingProc" and "OtherMarineTension" had high code counts, with 106 and 82 applications, respectively. Interviewees felt their towns had no jurisdiction over their own waters, constantly pointing to the idea of "home rule" as a reason for wanting their own autonomy, and feeling frustrated that they were bound by DMR regulations while they viewed the DMR as inefficient, underfunded, understaffed, and unprepared for large-scale aquaculture project proposals, while

also valuing aquaculture growth over wild-catch fisheries. One aquaculture advocate explained, "The argument I hear put forward is that aquaculture is growing unregulated too fast. There's no regulation. And they're coming to take your rights away as a fisherman and that's gonna mean your family will suffer." Confidence in the state regulatory process was low; stakeholders were able to identify growing aquaculture tensions but expressed concerns that the state was incapable of reviewing or changing their regulations, mentioning the state feedback process felt "very disconnected from what they actually should be asking," (Town Manager), neglecting individual town cultures or priorities. Stakeholders also mentioned they felt the state failed to view lease approvals holistically:

> It's not managed in this holistic whole bay on all those levels of cultural, social, economic and environmental. We're not talking about all those things at the same time, and so I think there's just a risk of approving lots of individual permits and sites without understanding the collective impact. (Town Manager)

Reviewing leases by isolating them from the greater context was a point of interviewee frustration. Some community members believed the DMR should evaluate leases based on community character and shared values, while others focused on the existing economies of towns, such as tourism and recreation. All of them, however, agreed that the DMR should be considering community feedback and feelings of acceptance or rejection when evaluating lease applications. In climax thinking terms, communities shared ideas of whether or not their ideal towns and viewscapes included aquaculture, and if it did, what types; there were clear standards for what was acceptable for a place and what was not.

DMR standards were also viewed as too vague. "The standard for all of these [lease approvals] is [they] shall not unreasonably interfere [with other nearby activity], but what that

means is really difficult," one advocacy group member explained. Interpretation of the DMR's current lease applications is up to reviewers, and there is no definition for what could "unreasonably interfere" with other activity. In addition, the DMR's capacity for reviewing lease sites and ensuring aquaculturists were following state standards was under question. "I think when aquaculture was first starting in Maine, it was all these small projects and we just didn't really anticipate someone submitting one for something this big," a town manager explained. Moreover:

> They don't have the money, they don't have the personnel… they don't have the resources to do this.… I don't know what the number is, 10, 20, 25 acres, [but] there should be a set of regulations that apply to really big projects and we just don't have that yet. (Town Manager)

Stakeholders overwhelmingly agreed that if the state was going to restrict town abilities to regulate aquaculture, they needed to be able to adjust to the new, larger scale farm proposals which are becoming more common in Maine, or else towns should have more power in the decision-making process.

As mentioned in the introduction to this chapter, many other marine tensions were mentioned when stakeholders were asked about Frenchman Bay, demonstrating that the changes surrounding communities exist on multiple levels. The growth of the tourism industry, particularly with an increased rate of visiting cruise ships, was a concern; interviewees mentioned that cruise ships were made to dock in certain places to reduce visual presence on the landscape, but also that tourists from the ships could overrun town resources. Another issue was loss of the traditional working waterfront, as "there's no local fishing ownership, there's no working waterfront. The only access point for fishermen is the town pier, [which is] a parking lot, and the launching ramp is awful. You can't even get to it most days," a town manager

explained. Many managers mentioned that the remaining fishermen had heavy political pull: "not everything's equal when there are issues that impact fishermen. They get a lot of defense. You don't want to be opposed by the fishermen," a manger explained, while an advocate offered the reason, saying "they're very hardworking and they're exhausted." The shrinking of the working waterfront, in addition to issues rising from climate change and new regulations, such as protections for the endangered Northern Right Whale, were all mentioned when heritage fisheries were brought into conversation.

Concerns about coastal access points becoming privately owned, and restricting people from traditional uses, were also raised. "…shore access is a real problem, especially with all the house turnover, because most of the agreements aren't on maps," one town manager explained. "They're unofficial agreements where individuals just come in." Though there is a history of displacement within the Indigenous Wabanaki peoples on the Maine coast, now many non-Indigenous individuals are facing that displacement as well, as shorefront properties are bought and new owners are unaware or unsupportive of previous "handshake" access agreements. This has caused issues for working individuals, such as shellfish harvesters, as well as community members who enjoy beachfront walks or launching their kayaks along the shore. The lack of affordable housing tied to increased privatization and gentrification on the Maine coast was a point often brought up by interviewees, who described it as a "crisis," noting that many individuals who worked in their town's tourism industries could not actually afford to live in town. These issues were not directly tied to the proposed American Aquafarms salmon farm, but were raised in conversation, highlighting the many and varied changes that many Maine coastal communities, but especially those surrounding Frenchman Bay, are facing, often all at the same time.

CHAPTER 5
CONCLUSION AND RECOMMENDATIONS

REVIEW OF FINDINGS

Based on the reviewed literature and the grounded theory approach, two research questions and three sub-questions guided data collection and analysis. The following is a summary of results relevant to each question, as discussed in Chapter 4.

RQ1: What (if any) risks or benefits do stakeholders associate with the proposed Frenchman Bay aquaculture project?

Environmental risks

- Stakeholders mentioned concerns over nitrogen loading in Frenchman Bay, potential fuel spills from fish farm barges, light pollution, and noise issues. Stakeholders mentioned the bay in its current state felt "pristine" and "natural," and were averse to introducing anything to the bay which could change that state.
- Concerns over the untested nature of closed net-pens, a novel technology, were expressed, in line with Johnson and Rickard (2022), which found that "untested" technology is seen as risky and potentially dangerous.
- Scale was a major concern for stakeholders, as most aquaculture leases in Maine (>60%) are under 4 acres (DMR, 2022) and the proposed American Aquafarms project would occupy 120 acres. The large scale of the project was seen as risky, untested, and difficult to contain should an issue, such as fish escapes or disease, break out.

Community risks

- The potential benefit of new jobs created by the Frenchman Bay farm were quickly dismissed by stakeholders, who felt the farm would disrupt current marine commerce such as small-scale aquaculture producers and fishermen, especially lobstermen.
- Stakeholders were concerned that a large-scale, "industrial" fish farm would disrupt the tight-knit, local focus of their current communities.

1a.) Broadly, how does sense of place impact willingness to accept environmental risk?

- Stakeholders valued the aesthetic of their surroundings, especially their proximity to Acadia National Park and the multitude of recreation opportunities (paddling, hiking, cycling, boating, fishing) readily available.
- Value of aesthetics contributed to an unwillingness to accept a project which could visually disrupt the land or seascape, especially on a large scale which would be prominently visible above the water and from the top of "iconic" landmarks such as Cadillac Mountain in ANP.
- Gouldsboro and Bar Harbor were seen as places with ties to fishing and marine economies, and accepting a project which could further disrupt a shrinking population of fishermen was seen as rejecting and erasing the region's history and culture.

1b.) How does sense of place impact community acceptance/rejection of the proposed Frenchman Bay aquaculture project?

- Many stakeholders had personal histories and connections to their communities, mentioning family ties or relationships which had spanned years connecting them to

place. Changing the place from small and tight-knit to more "industrial," especially with a foreign company which felt difficult to communicate with, was seen as counter to the local relationships which built the community.

- Stakeholders are aware that the population of fishermen and lobstermen is shrinking and the fishing industry is becoming more difficult to navigate. They lament the loss of their traditional working waterfront, suggesting living in a place with a working waterfront is important to their identities and sense of where they live (i.e., a fishing town vs. a tourist town).
- Change in coastal access (privatization of formerly public space) was an issue raised by stakeholders, who seemed to agree that coastal access was an inherent part of where they lived. More private ownership (i.e., the fish farm lease) was seen as further removing publicly accessible spaces.
- Stakeholders felt that the bay was "empty" and that overall, there was not much industry in the bay, which allows it to appear "natural" and "pristine."

RQ2: What is the salience of Frenchman Bay to stakeholders, and what values and meanings do they attach to it?

- Stakeholders had strong aesthetic, historical, and recreation-based connections to the Frenchman Bay area.
- The Bay was seen as visually appealing to stakeholders, a key part of why they enjoyed spending time on and around the Bay.
- Personal and other histories were often mentioned, usually accompanied by stories of change over time. A large draw of the bay for personal histories, and stories about growth

in the area, was the visual attractiveness of the region and the many recreational opportunities available.

- Frenchman Bay was referred to as a working waterfront, but on a small scale, with small aquaculture leases and independent lobstermen. This was key to stakeholders, who valued the small-scale, traditional working waterfront aspect of the Bay, though they mostly did not participate in it themselves.

2a.) What terms do stakeholders use to describe relationships with and values and meanings of Frenchman Bay?

- Stakeholders described the bay as "beautiful," "natural," and "pristine," and referenced the lack of industry in the bay as a positive thing which had contributed to preserving those items.
- Some stakeholders mentioned Frenchman Bay as being the place they literally "got their feet wet" in terms of connecting to the greater Maine coast.
- Frenchman Bay and its surrounding communities were seen as small, idyllic Maine coastal towns, contributing to stakeholders' sense of place and personal identities as people who lived in these unique and culturally relevant places.

Though many findings emerged from this research, I believe the most prominent finding, which underlies all other findings, is change. Coastal communities are facing a multitude of changes up and down the East coast, and the Maine coast is no exception – as mentioned in the Introduction to this thesis, the growing aquaculture sector, increased tourism, rising home prices, and shrinking wild-catch fisheries are all impacting the nature and character of small towns. These changes were reflected in stakeholder interviews— stakeholders were aware of the many

changes occurring, and were also adamant that those changes were interconnected. Further exploration of these changes will be addressed in the conclusion and recommendations section below.

CONCLUSION AND RECOMMENDATIONS

Coastal communities across the United States are facing a multitude of changes, and Maine is no exception. The rise in tourism, increase in purchase of seasonal and vacation homes by out of state residents, shrinking of traditional working waterfronts, rising ocean temperatures, and proposal of new projects requiring novel technologies and/or large infrastructures are all co-occurring, challenging traditional ideas of what landscapes 'should' look like, who has a right to access those landscapes, and who, exactly, 'belongs' in Maine. American Aquafarms' closed net-pen salmon farm proposal for Frenchman Bay, Maine became a flashpoint in this already tangled set of conflicts, a symbol for the change facing coastal Maine and an outlet for community members to express their frustrations at feeling left out of the conversation.

This research into stakeholder perceptions of environmental risk, landscape values, and the expansion of aquaculture in Maine has shown that stakeholders care deeply about their coastal towns and character. Stakeholders placed high values on visual aesthetics, a sense of naturalness, and recognizing small-scale, localized working waterfront activities which contribute to their sense of the value of living in a small, tight-knit community. The perceived risks that the American Aquafarms project presented included environmental damage, disruption of visual aesthetics, and a sense of "industrialization" of the bay and surrounding towns. This threatens to change the character of a relatively insular community with values based in natural features and a recreation and tourism-based economy to a more resource-extractive economy, which focuses on large-scale projects to create high-value products (Atlantic salmon) in a larger,

more industrial space. Based on stakeholder responses to the interview questions, it seems all these changes challenge the idea of what community members hold as the "ideal," or "climax community" (Sherren, 2020) for their towns.

As mentioned previously, these changes are not new, and the American Aquafarms project is not the first in Maine to propose or symbolize changing waterfronts. There has been a heavy media and community focus on proposed land-based recirculating aquaculture systems (RAS) in Maine in recent years (Johnson & Rickard, 2022; Rickard et al., 2022), as well as traditional aquaculture leases and expansions (Bever, 2021; Bever, 2022; Gurney et al., 2022). The number of aquaculture leases in Maine waters grew from approximately 110 to 308 between 2017 and 2022 (Island Institute, 2023; DMR, 2022), and there are currently 65 additional leases under review with the DMR (DMR, 2023). Notably, the project proposals which face increased public scrutiny and pushback are typically finfish projects; shellfish and kelp seem relatively accepted (Bever, 2021; Rappaport, 2023), perhaps due to their history of cultivation on the Maine coast, smaller visual impact, and ability to use a smaller lease space to produce (Joyce & Satterfield, 2010)[10]. The increase in aquaculture lease applications, its further anticipated growth, and the shrinking of wild-catch fisheries indicate that aquaculture growth, both land-based and in the water, is an issue that Mainers will continue to face. What happens next is up to them.

Mainers will need to decide collectively and collaboratively what they want the future of aquaculture growth to look like. Based on the Frenchman Bay conducted research, a series of

[10] Aquaculture siting has still produced a great deal of conflict; for more on this, see Joyce & Satterfield (2010) and their work on displacement of Indigenous peoples in shellfish aquaculture or Samuel Hanes' (2018) work on aquaculture conflicts in Maine.

recommendations and items for stakeholders and aquaculturists to consider is offered below. While these items are specifically formed based on insights from the Frenchman Bay interviews, the similar nature and shared values of many Maine coastal towns should be considered in whether this may have applications for other communities. Several of these recommendations, specifically those dealing with attention to community and/or regional differences, have also been touched upon by Britsch (2021).

COMMUNITY TRUST AND INCLUSION

A main finding from the Frenchman Bay research was the community's frustration at feeling "left out" of important conversations regarding the aquaculture project, and feeling disconnected from the company proposing to build the fish farm. This led to feelings of distrust not just in American Aquafarms as an entity, but in the proposed closed net-pen technology and estimated environmental impact of the farm. Stakeholders mentioned that community members did not feel their concerns were listened to or their questions answered, a tie-in to the concept of procedural fairness, or the extent to which an audience perceives their "voice" as heard and a process as fair, which is known to have impacts on stakeholder rejection or acceptance of development projects, also known as social license to operate (Alexander, 2022; Rickard et al., 2022). In the future, aquaculturists or large-scale project proposers should consider how they will work with the community they want to build and operate within. Public meetings must show actual intention to listen, plans should adapt and change based on community input, and members of the project should be present in the community – in grocery stores, coffee shops, and on the streets – to encourage organic conversation. Specific community concerns should be addressed, with solutions for mitigation of those concerns offered by the company or co-created

with community leaders. Community involvement could build trust and establish a rapport for understanding on both sides.

SCALE

The largest emergent finding from this research was concern over scale. "Large scale" aquaculture leases (site > 4 acres) are uncommon in Maine waters, with over 60% of current leases in Maine occupying 4 acres or less (DMR, 2022), and the current largest aquaculture lease, held by Moosabec Mussels, totaling 89.7 acres (DMR, 2022), an area smaller[11] than the 120 acres requested by American Aquafarms. Communities feel the growth of large-scale aquaculture is disruptive to the character of their working waterfront, changing the nature of commerce while intimidating individuals and upsetting their sense of place. It can also disrupt an individuals' idea of what their "climax community," or ideal community state (Sherren, 2020; Sherren et al., 2022), looks like – if an individual sees a small, local working waterfront as ideal, an "industrial," large-scale fish farm does not fit that view. Potential aquaculture projects should consider what kind of scale they need to operate, and what their physical impacts will be. If a project can be made to be minimally visually invasive, or operate on a smaller lease, this may be received as more acceptable to potential site communities. Projects should also consider what kind of communities they will be adjacent to when planning their projects – will their project disrupt a community's sense of identity? Will they be able to bolster the community from both their and the community's perspective? Considering these questions in advance, especially by meeting with community stakeholders, may add extra time to a project, but ultimately could

[11] The proposed American Aquafarms project is a total of 120 acres but actually uses 2, 60-acre sites instead of 1, 120 acre site. The total lease acreage is therefore larger than the Moosabec Mussels site.

grant a stronger social license to operate and minimize community pushback (Rickard et al., 2022).

Department of Marine Resources

An unexpectedly prevalent finding which occurred throughout interviews was high discontent with the Maine Department of Marine Resources (DMR) aquaculture lease permitting and review process. Communities feel they do not have power over the decisions being made regarding waters they view as "theirs," and furthermore, feel the DMR is understaffed and underfunded, making them unable to adequately assess and manage aquaculture leases. This is echoed by other recent reports, such as the Maine Aquaculture Hub's 2022 Maine Aquaculture Roadmap. Communities also feel that the current lease application process does not take the scale of the lease application into account. There is no quick and easy solution to address discontent with a statewide agency's permitting process; however, there are certain points that should be considered by the DMR. Differing lease criteria may be introduced depending on scale for aquaculture licenses, and the public feedback opportunities may need to be expanded to allow for 1) more opportunities for public feedback and 2) timely integration of that feedback. Community stakeholders should be engaged by the DMR for specific lease reviews, to ensure that local concerns and ideas are addressed and integrated into the lease review. Further, it should be made more clear what towns have the ability to do regarding aquaculture leases; many are under the impression that they can impose a moratorium on aquaculture projects when in fact, they do not have legal jurisdiction over waters past the low-tide line (Maine Sea Grant, 2016)[12]. An increase in DMR staffing or funding is a way to address some of the issues outlined,

[12] There are several layers of nuance regarding intertidal access and ownership on the Maine coast. For more information, see Maine Sea Grant's *Public shoreline access in Maine: A citizen's guide to ocean and coastal law*.

but those staff and/or funding increases will need to occur with strong, concrete ideas on how those staff and funds will be applied.

Aquaculture and Wild-Catch Tensions

Though not a focus of this work, an undercurrent of the tensions between aquaculture and wild-catch fisheries was present in the collected interviews. The perceived political power of lobstermen, the voiced concerns over losing fishing as a way of life and viable way to support a family, and the concerns over the rapid growth of aquaculture all highlight how these two marine sectors are facing tensions which often pit them against one another (Gurney et al., 2022). Many fishermen feel threatened by the rapid expansion and growth in funding aquaculture is seeing, while simultaneously feeling that their wild-catch work is becoming more intense, requiring longer hours and higher efforts for the same or less catch amount, more regulated, and less valued (Gurney et al., 2022). With the increasing impacts of climate change raising ocean temperatures and causing unpredictable or more intense storms, alongside human impacts on the environment such as overfishing wild-catch populations and impacting endangered species numbers (such as the North Atlantic Right Whale), fishermen feel their environment is becoming more hostile and their jobs less understood, leading to many wondering if there is any future in Maine's wild-catch fisheries (Gurney et al., 2022). In the Frenchman Bay interviews, many stakeholder interviewees mourned the loss of Maine's working waterfront, citing their enjoyment at seeing lobstermen or other fisheries workers out on the water and how it imbued them with a sense of a "traditional" Maine working community. Two interviewees mentioned personal experience working in Maine fisheries. Fishermen, however, have cited an inability to recruit youth or other newcomers to the fishing workforce while simultaneously voicing concerns that recruitment of new fishermen is a "lost cause" due to the instability of the fishing industry and a

lack of confidence in its future (Gurney et al., 2022). These two perspectives are at odds with one another, suggesting that the idea of what constitutes a "traditional" or "heritage" workforce in Maine (fishing) is valued as a symbol but perhaps not an actual employment opportunity. Further research is needed to assess the viability of the future of Maine fisheries, as well as the values which underlie why many Maine residents support fisheries and lament their loss while simultaneously lacking interest in entering the fisheries themselves. If wild-catch fisheries are no longer viable, aquaculture may be the next step for Maine, though many fishermen are hesitant to become aquaculturists themselves, seeing it as becoming "farmers" rather than fishermen (Gurney et al., 2022).

STUDY LIMITATIONS

As with any research project, there are constraints upon what is possible and what is accomplished. This study was no exception. No fishermen were interviewed as stakeholders for this research; fishermen are important stakeholders in the overarching Frenchman Bay discussion but were not engaged due to the study's focus on management decision-makers. Future work should include fishermen, who are regularly "on the water" of the Bay and likely have strong SoP attached to the Bay. In light of some of the discoveries made in this research, such as strong feelings that DMR regulations should change, fishermen should be consulted for their viewpoints and input.

Only fifteen stakeholders total were engaged for this study. This was considered representative enough to fulfill this study's needs based on previous literature and qualitative research (Lindlof & Taylor, 2011), especially because many of the interviewees expressed the same issues and concerns regarding Frenchman Bay project, creating "theoretical saturation," or the concept that more data collection from the stakeholder groups would not uncover more

themes or information (Glaser & Strauss, 1967). However, inclusion of other stakeholder groups could contribute greatly to this work by providing a more holistic representation of community perceptions of Frenchman Bay and the proposed American Aquafarms project.

Finally, this study was constrained by the two-year Masters' timeline. Time limited all aspects of this work, from literature review to interviewee recruitment to the actual writing of this thesis. No study is perfect and conducted with an unlimited timeline, but the traditional two-year MA program creates a condensed research environment where much work must happen quickly. When designing this study, the two-year timeline had to be considered, and all proposed work had to occur within the specified timeframe. A project with larger or more inclusive scope was simply out of bounds. These timeline constraints were, however, somewhat alleviated by my participation in the National Science Foundation-Natural Resources Traineeship program, which enriched this timeline by providing numerous opportunities to supplement my work, such as through an internship during Summer 2022 focused on the Young Fishermen's Development Act through Maine Sea Grant, and through support for travel to conferences (e.g., the annual meetings of the Society for Risk Analysis and the International Association for Society and Natural Resources) and aquaculture workshops where numerous stakeholders gathered and shared information.

Personal transformation

This work was personally transformative. This was the first research project I have fully designed, implemented, and followed through on in my graduate academic career. Though I have carried out research before, it was always for other people or projects, and was not wholly my own. Finding a subject which not only interested me, but also felt like it had implications for the communication and social science disciplines, was new – and much more enjoyable than I

anticipated. When I was applying for graduate school, I was looking forward to honing my skills and furthering myself at a higher academic level, but I had no intention of continuing past my Masters' degree. Near the completion of my data analysis for the Frenchman Bay work, I realized I felt challenged, fulfilled, enlightened, and like I didn't know anywhere near enough – and realized with a start that I wanted to continue my research and education with a PhD. I enjoy researching and learning, and the academic environment leaves me feeling *myself* in a way nothing else quite has. Doing this work allowed me to see that.

This work was also personally transformative as it was carried out in an interdisciplinary fashion. As mentioned previously, I am a participant in the NSF-NRT Conservation Science program, which added additional coursework and requirements to my Communication MA program. I entered the program feeling I already knew how to do interdisciplinary work and communicate across fields because of my previous job experience as a Community Outreach Coordinator for an environmental research firm. This was an incorrect assumption. The actual process of working with my peers across fields, having to explain my research and how social science fits within the complex web of environmental and conservation concerns, was an invaluable experience. I realized I have to truly believe my work is important, because nobody else will automatically do that. It is up to me to see the value in my work, and then communicate my work and that value to others.

CLOSING THOUGHTS: CHANGE, CLIMAX THINKING, AND THE FUTURE OF THE MAINE COAST

While the ideal Maine coastal town may be small, idyllic, and tightly localized, the changes currently being seen along the Maine coast, summed up in the American Aquafarms proposal, show that challenges to this ideal are unavoidable and the "perfect" Maine coastal town

simply does not exist. The static image of the small, charming Maine coastal town is now at odds with the changes being faced in Maine – changing demographics, as the population grows, becomes less white, and slowly, less elderly (Maine State Economist, 2016), changing climate, as the Gulf of Maine warms three times faster than the world's oceans (GMRI, 2022), and changing physicality, as coastal Maine gentrifies and begins to see a shift in investments from wild-catch fisheries to aquaculture (Ogrysko, 2023). These changes are only going to continue, and will require proactive, holistic planning by towns if they are to "weather the storm," both literally and figuratively.

Aquaculture is growing and changing in Maine. The rise of land-based RAS, the increasing acreage sizes of aquaculture lease applications, and the expanding number of aquaculture farms are all coalescing to create changes large and small to Maine's marine economy. These changes, and how communities choose to face them, will impact the future of the state. As one Advocacy group member stated,

> [This is] not a once in a lifetime decision. It is a one-time decision because what we do here to develop aquaculture is going to affect our children's lifetime and probably our grandchildren's lifetime. We're at an inflection point of growth and what we do now may have a long-term effect if Maine's going to turn into an aquaculture state. And once it does, in whatever form that takes, it's unlikely to change significantly in future generations.

In the case of the proposed Frenchman Bay project, managers and decision-makers in Gouldsboro and Bar Harbor saw the project as ill-fitting and environmentally and culturally disruptive. Their decisions could set a precedent for the future of aquaculture development in their areas. There is no "right way" to make those decisions, or determine the future of a town, but the time for proactive planning is now, or else managers will continue to find themselves

faced with large, surprising projects they feel disconnected from, and more community tensions will arise. This insight is not new; Britsch (2021) discusses the importance of stakeholder collaboration, acknowledgement of regional differences, and facilitated conversations in her thesis and resulting manuscript, and these items are already happening. One need look no further than Belfast, Maine where the community has been split over whether they should support a proposed land-based RAS facility; legal battles have ensued, and there are deep fissures in longstanding community ties (Rickard et al., 2022).

Change is inevitable in Maine; however, it conflicts with many strong forces: the idea of "what Maine is," being a "true Mainer," and ultimately, the state slogan: "The way life should be." All of those things have different meanings to different individuals and communities, and the future, or perhaps "the way Maine *should* be," is being discussed and decided upon right now. Many communities in Maine see themselves as having already reached their climax state, a state they see as ideal and want to return to no matter the disturbance. This can put them in opposition to new projects and new ideas, such as the proposed American Aquafarms salmon farm in Frenchman Bay, making them seem anti-modern and anti-change despite Maine's rich history and culture. These new projects and ideas will continue to come to Maine. The impacts of climate change, increasing global demand for protein, especially seafood, and advancement in technology are all bringing aquaculture to Maine's forefront, and how it grows in Maine – for it inevitably *is* growing – depends on how communities see themselves in the years to come. Who is a Mainer? Is that an inclusive or exclusive term? Does it include newcomers and new ideas, or does it mean maintaining a traditional, rich cultural heritage? Or is there a place between, where a balance can be struck between the two?

It is my sincere hope that this work can be applied to aid the conversation and decision-making regarding Maine's changing coast by sharing insights into community perceptions and ideals. I wanted to do more than simply uncover information about how stakeholders in Bar Harbor and Gouldsboro felt about the Frenchman Bay salmon farm; I wanted to be able to provide those stakeholders, and others I didn't speak with, with a body of work they could use to understand the situation and context of the farm proposal more fully and holistically. It wasn't just that the project is big; it's that there's no history of a farm this big in Maine, and the physical structures of the farm would interrupt community member's views of the Bay and their feelings that they lived somewhere natural where local people fished for an honest living. It wasn't just that people distrust the state government to a certain degree; it was a distrust built on funding and staffing issues that have been accumulating over time and shown to be inadequate, as well as a feeling that municipalities lack control over their own waterfronts. It wasn't just that people felt American Aquafarms' "PR sucked," it was that they felt nobody from the company, or on the state level, engaged with them in meaningful and responsive ways. It wasn't just that community members didn't want a fish farm, it was a feeling that change is occurring on many fronts and challenging a "traditional" Maine coast way of life. Controversial issues do not exist in a vacuum, and this case is no exception. I hope that this work helps to facilitate and move conversations forward regarding the future of the Maine coast.

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APPENDICES

APPENDIX A: INTERVIEW PROTOCOL

[Introduce self and project; thank individual for participating. Review the informed consent form and seek permission to record interview. Ask the individual if they have any questions before we begin.]

Introductory Information / Sense of Place

1) Tell me about your experience in [*management Acadia NP / town government for Bar Harbor / Gouldsboro*].

   How long have you lived here?

   Why did you move here?

   Do you live in town or out of town?

   How did you come to be associated with [*ANP or town of Bar Harbor / Gouldsboro or advocacy group*]?

2) What kind of place is [*ANP / Bar Harbor / Gouldsboro*]?
   What makes it special/distinctive?
   What do you like most/least about it?
   (If not mentioned) Tell me about Frenchman Bay. What is it like? For example, are there particular natural features that are important to locals and others, such as tourists? To management in [*organization*]? What do you do to preserve or protect it?

Experience with / Perceptions of Aquaculture (generally)

3) When you think of aquaculture, what comes to mind?

What do you see as its most important benefits? Drawbacks or risks? [*Probe to gauge if individual sees these benefits/risks as occurring at various levels, e.g. the community, state, country.*]

4) Have you heard of different types of aquaculture? If so, what types?

5) How do closed net-pens relate to other forms of aquaculture?

Experience with / Perceptions of proposed Frenchman Bay Project

6) What makes this project well-suited to the community? What might make it a less-than-ideal location?

7) Tell me about the process of siting the Frenchman Bay project. How and when did this process begin? Possible probes may include:

When did you start following the progress of this project?
What is your understanding of the status of the project to date?
What have been some of the successes/challenges in siting this project in your community?
What has been your role (or roles)?
Have you taken any action or been involved in any activities to promote or counter the siting of the project? If so, what have those specific activities been?

8) Who/what are some of the key stakeholders in the siting process, including individuals and organizations in the public and private sectors?

In your opinion, to what extent do community members trust these actors? Why?

Discourse about Net-Pen Salmon Aquaculture

9) How has American Aquafarms promoted this facility? How about Bar Harbor or Gouldsboro? The state of Maine?

For instance, have there been public events, such as public meetings, informational sessions, promotional materials, etc.? [*Probe for specific examples.*]
Are there events planned for the future?

10) How else has this facility been represented in the public discussion?

For instance, has it received local or state news media attention? From your perspective, how has this coverage presented the project (and aquaculture more broadly)?

11) Before we wrap up, considering the types of questions I asked you today, is there anyone else in your community who is in a managerial-type position, like you, who might be a good person to speak with?

[Thank the participant, making sure to leave appropriate time for questions, debriefing, and/or other comments, i.e., “Is there anything else you would like to add that we didn’t get to in this interview?]

APPENDIX B: RECRUITMENT EMAIL

Dear (_____),

My name is Gabriella Gurney and I am a Master's student in the Communication and Journalism department at the University of Maine. I am writing to request your assistance in my research project to understand how decision makers in the Frenchman Bay area value the bay. You have been selected based on your involvement (*in management-level decisions, with the advocacy group _____)* in (_____) *(Acadia National Park, town of Bar Harbor, town of Gouldsboro)*, and I have obtained your contact information from (_____) (*Acadia National Park, town of Bar Harbor, town of Gouldsboro, advocacy group website)*.

In particular, I am interested in learning how you value Frenchman Bay and how that impacts your (*management, advocacy*) decisions in regards to the proposed American Aquafarms closed net-pen salmon farm in the bay. I wish to understand what leads to acceptance or rejection of proposed large-scale projects like this one, and by hearing your perspective on this matter I believe better understanding of such projects can be reached. This is important as many of these projects, whether land based or marine aquaculture, will be proposed as we continue to face rising global populations and focus on combatting the adverse impacts of climate change.

If you are interested in participating in this interview, we will organize a time of your convenience. Our conversation would take approximately 45 minutes to one hour and can be held at a location of your choosing, including over Zoom. With your permission, the conversation will be audio recorded. Anything you share with me during the conversation will remain confidential and your name will not be connected with any findings. Participants must be 18 years or older to participate. For more information about the study, please see the attached Consent Form.

Please contact me at gabriella.gurney@maine.edu or at (518) 708-5594 if you would like to participate. If you have any questions, you may also contact the faculty sponsor, Dr. Laura Rickard at laura.rickard@maine.edu. Please note that participation in this study is completely voluntary. Interviews will take place over the Summer and Fall of 2022.

Thank you,

Gabriella Gurney

APPENDIX C: INFORMED CONSENT

Informed Consent

You have been asked to participate in a research study based on your involvement as a management level decision maker of Acadia National Park or the town of Bar Harbor or Gouldsboro, or as a member of a Frenchman Bay advocacy group. This study is being conducted by personnel from the University of Maine in Orono, including Gabriella Gurney, a MA student in the Department of Communication and Journalism, and Dr. Laura Rickard, an Associate Professor in the Department of Communication and Journalism. The purpose of this study is to understand management level decision makers' and advocacy group member's values attached to Frenchman Bay and how these affect acceptance or rejection of the proposed American Aquafarms closed net-pen salmon aquaculture facility. Participants must be 18 years or older to participate.

What will you be asked to do?

If you decide to participate, you will be asked questions about your role in local management or advocacy and the values and themes you associate with Frenchman Bay. You will also be asked about your perceptions of the proposed closed net-pen salmon farm in Frenchman Bay. Sample questions will include "What kind of place is Frenchman Bay?" "Tell me about your experience as management," And "When you think of aquaculture, what comes to mind?" The entire interview will take approximately 45 minutes to one hour and will be audio-recorded. Recordings will occur with your permission, and notes will be taken if you do not wish to be recorded. Interviews will be conducted via Zoom or in person.

Risks

Your time and inconvenience are foreseeable risks with this study. Another conceivable risk is community response to individual opinions; for this reason, all interviews and associated information will be kept strictly confidential and your name and any identifying information will be removed before any study findings are reported.

Benefits

You may not receive direct benefits from this study, but participation is important to the success of the study and will contribute to overall understanding of management-level response to proposed aquaculture development in Mount Desert Island and elsewhere in Maine. Understanding local management response to proposed projects of this type is key as more sustainable projects will be marketed and proposed due to increasing pressures from climate change and global population increase.

This project will benefit present and future proposed project-community interactions. Corporate entities will receive information about important stakeholder groups' opinions that may assist them in interacting

with communities in a respectful way which considers community priorities. Community leaders will gain insight into their own management process by better understanding how their values impact management decisions.

Confidentiality

The responses you provide will be treated as professional confidences. No information which may be used to identify you will be presented in any possible reports or communications, or referenced to other participants. Interview recordings will be uploaded to the secure transcription platform Descript. Once interview recordings have been transcribed, they will be removed from Descript. Interview data will be downloaded off of recording devices to Gabriella Gurney's computer and immediately deleted from the recording device. Zoom recordings will be deleted off Zoom within 48-72 hours. Data will be stored on a password protected computer and destroyed after transcription or one year (September 1, 2023), whichever comes first. Notes taken for non-recorded interviews will be taken on a password protected laptop, de-identified, and stored indefinitely. De-identified transcripts will be stored indefinitely on a password protected computer.

Voluntary

Participation is voluntary. If you choose to take part in the study, you may stop at any time or skip any items during the interview.

Contact Information

If you have any further questions, comments, or concerns about the study, you may write or call principal investigator, Gabriella Gurney at (518) 708-5594 or gabriella.gurney@maine.edu. You may also contact faculty sponsor, Dr. Laura Rickard at (207) 581-1843 or laura.rickard@maine.edu.

If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine at (207) 581-2657 or umric@maine.edu.

APPENDIX D: SNOWBALL SAMPLING RECRUITMENT EMAIL

Dear (_____),

My name is Gabriella Gurney and I am a Master's student in the Communication and Journalism department at the University of Maine. I am writing to request your assistance in my research project to

understand how decision makers in the Frenchman Bay area value the bay. . You have been selected based on your involvement (*in management-level decisions, with the advocacy group _____)* in (_____) *(Acadia National Park, town of Bar Harbor, town of Gouldsboro).* (*Previous interview participant*) suggested I reach out to you and shared your contact information with me.

In particular, I am interested in learning how you value Frenchman Bay and how that impacts your (management, advocacy) decisions in regards to the proposed American Aquafarms closed net-pen salmon farm in the bay. I wish to understand what leads to acceptance or rejection of proposed large-scale projects like this one, and by hearing your perspective on this matter I believe better understanding of such projects can be reached. This is important as many of these projects, whether land based or marine aquaculture, will be proposed as we continue to face rising global populations and focus on combatting the adverse impacts of climate change.

If you are interested in participating in this interview, we will organize a time of your convenience. Our conversation would take approximately 45 minutes to one hour and can be held at a location of your choosing, including over Zoom. With your permission, the conversation will be audio recorded. Anything you share with me during the conversation will remain confidential and your name will not be connected with any findings. Participants must be 18 years or older to participate. For more information about the study, please see the attached Consent Form.

Please contact me at gabriella.gurney@maine.edu or at (518) 708-5594 if you would like to participate. If you have any questions, you may also contact the faculty sponsor, Dr. Laura Rickard at laura.rickard@maine.edu. Please note that participation in this study is completely voluntary. Interviews will take place over the Summer and Fall of 2022.

Thank you,

Gabriella Gurney

APPENDIX E. FULLY EXPANDED VERSION OF TABLE 1, INCLUDING CHILD CODES, CODE DESCRIPTIONS, EXAMPLE QUOTATIONS, AND TOTAL CODE APPLICATION COUNTS.

Table 1. Parent and child codes used in qualitative coding of the Frenchman Bay stakeholder interviews. Highlighted items were added for the second coding cycle.

Code	Child Code 1	Child Code 2	Description	Example Quotation	Code Application counts
10	15	3			
AquaType			There are many types of aquaculture, including shellfish, finfish, and kelp. These differences can result in different methods of farming, as well as perceptions of risks or impacts	"When I think of aquaculture, I think of oyster racks." (Acadia National Park official)	
Community			Community changes, responses, and inclinations to reject or support the AA project	"We live in a place built around protection and the idea of protecting beautiful places. So I think when you try to put something like a salmon farm next to that, you have an extra battle on your hands because you have a citizenry that's of that mindset and understands that value." (Town Manager)	
	Change		Historical or modern changes in the community	"[The community is] getting older. There's more retired people coming here, less families	

Table 1 continued

				being here. It feels less community minded." (Town Manager)	
	Rejection		Reasons for rejection of the AA project	"It's the scale, the volume of the fish, that it's two farms, not one. It doesn't help that it's a company from away." (Advocacy Group member)	
	Support		Reasons to support the AA project	"I actually think some aquaculture in the bay is good in terms of supplying jobs." (Town Manager)	
	TightKnit		Mentions of the close nature of the community: supporting one another, having a tight knit experience	"I didn't grow up in a community where you know everybody, and I like the fact that you can do that here." (Town Manager)	
EnvRisk			Environmental risks or risk perceptions	"This project, because of the feed mostly, would introduce so much nitrogen to the bay environment that it may not be sustainable to any life in the bay." (Town Manager)	
	Benefits		Perceived or actual benefits of aquaculture	"This was supposed to be environmentally friendly, save the world, feed the people, really expensive premium salmon." (Advocacy Group member)	

Table 1 continued

Good Quotes			Good quotes that synthesize or sum up emergent themes or perspectives	“I feel like there’s a lot of different swirling conversations that are happening in different places that are all really connected. For me, the bigger idea is how do we help local government boards and structures get the information they need?” (Town Manager)	
LicensingProc			Licensing, as well as other legal processes, mentioned	“I think it’s one of those things where you don’t really look at the rules or regulations until someone proposes.” (Town Manager)	
	"needs change"		Mention of the aquaculture licensing process needing change	“The state tries to figure out a process to [determine how much is enough]… I don’t know that the state is capable of doing that, or if they need a third party to do it.” (Advocacy Group member)	
	Zoning		Issues dealing with coastline zoning	“We don’t have jurisdiction over the open water, only down to low tide.” (Acadia National Park official)	
Media			Media references, including social, TV, news	“There was a Maine Public Radio story on this.” (Acadia National Park official)	

Table 1 continued

	Public meetings		Public meetings which occurred	“American Aquafarms had a public meeting in Gouldsboro.” (Town Manager)	
OtherMarineTension			Other marine related tensions that are not AA - other farms, lobstering, fisheries, right whales, etc	“There was some other stuff going on with parking out on the pier and just this sense that fishermen were feeling like the town didn’t really care about them.” (Town Manager)	
Scale			Specific mentions about aquaculture scale, large or small	“Like anything else in the world, it’s a matter of scale.” (Advocacy Group member)	
	"large scale"		Large scale or "industrial" mentions	“As soon as we learned about it, we became pretty concerned just based on size.” (Acadia National Park official)	
	"small scale"		Small scale or small farm mentions	“A vast majority of [aquaculturists in Maine] are not really increasing their footprint, or if they are, they’re going from something very small to still something very small.” (Advocacy Group member)	
SoP			Concerning sense of place and place attachments	“There’s something that draws people here. I think it’s the rocky coast. I think also the fact that it’s right across the bay from Bar	

Table 1 continued

				Harbor, plus part of Acadia National Park is here on the peninsula." (Town Manager)	
	"what I like"		What interviewees like about their places, towns, or Frenchman Bay	"I just wanted to be on the ocean and that ocean culture was really just a good fit and match for me." (Town Manager)	
	Aesthetic		Beauty and aesthetic mentions	"I like the physical environment. It's a very beautiful place." (Town Manager)	
		Industrial	Mentions of FB as an industrialized, worked landscape	"It's not like there's a lot of industry here." (Town Manager)	
		Pastoral	Mentions of FB as a "pastoral" or natural, respite landscape	"Sometimes people call it a pristine bay." (Town Manager)	
	History		Area or personal histories and connections to place	"I have never lived in as small a town with as much of a local history." (Town Manager)	
	Identity		Person mentions Frenchman Bay is a part of them, or important to who they are as a person	"I was born and raised [here] and I have worked for the town for many years." (Town Manager)	
		Time	Time spent in communities near FB	"I've been here 22 years." (Acadia National Park official)	

Table 1 continued

	Recreation		Recreation opportunities and values	"It's access to the natural resources. The ease for me to go hike a mountain one day or hop in a kayak and cruise around the island or into the bays." (Town Manager)	
Trust			Trust in major players, including AA, DMR, town governments, and local organizations	"The former [American Aquafarms] CEO was a convicted felon… the whole thing just kinda leaves a bad taste in your mouth." (Town Manager)	

BIOGRAPHY OF THE AUTHOR

Gabriella Gurney was born June 24, 1997 in Woodstock, Illinois. She was raised in Saratoga Springs, New York and graduated from Saratoga Central Catholic High School in 2014. She attended St. Lawrence University and graduated *Magna cum laude* with a dual degree in Conservation Biology and Performance and Communication Arts, and a minor in East African Studies. During her time at St. Lawrence University, she worked at various research stations and parks in Wilton, New York, Laikipia County, Kenya, and Shenzhen, China, which inspired her capstone thesis, the one-act play *Rosy Mountain National Park* which sought to fuse ecological theory with the dramatic arts. She lived and worked in the Adirondack Park of Upstate New York for three years as an ecologist, cartographer, and community outreach coordinator before moving to Maine in 2021 to begin her Masters degree. Gabriella is a candidate for a Master of Arts degree in Communication and Journalism from the University of Maine in August 2023 and a member of the National Science Foundation-Natural Resources Traineeship in Conservation Biology.