

Exploring Climate Change and Community Engagement in the Museum

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**Abstract**

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With the unique tools and points of connection that define museums, they have a role to play in engaging their local communities on the topic of climate change. Washington State is now experiencing a variety of climate change-related effects including increased extreme heat events, droughts, wildfire, ocean acidification and more—these impacts will gain momentum as time and current human behaviors continue. The purpose of this study was to explore the dimensions of community engagement on topics related to climate change in small and mid-sized museums in Washington State. This study's aim was to characterize 1) the ways that practitioners in the State engage their community on this topic, 2) the barriers and opportunities presented, and 3) the potential impact of this engagement on the local community. Utilizing a case study design, data were collected through interviews with six museum professionals and institutional document analysis. The results of this study suggest that small and mid-sized museums in Washington State engage their communities on the topic of climate change using a diversity of strategies, consider local relevance in their messaging, and leverage their work in this vein

through partnerships. The engagement strategies described in this study may serve as a model for institutions interested in this work.

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**Table of Contents**

Chapter 1: Introduction.....3

Chapter 2: Literature Review .....7

Chapter 3: Methods .....27

Chapter 4: Results.....32

Chapter 5: Conclusions and Implications .....52

References .....58

Appendix A: Sample Email Request.....66

Appendix B: Consent Talking Points .....67

Appendix C: Instrument .....68

Appendix D: Coding Rubric.....70

## Chapter One: Introduction

*Dozens of wildfires that have been raging across the Pacific Northwest flared up this week, unfurling a blanket of opaque smoke from the Cascades to the coast and raining ash down on cars, streets and people. The blazes have forced evacuations and prompted the governor of Washington to declare a state of emergency; the skies have turned a disorienting color of brownish-orange, and the air smells of burned wood. “If you look outside, you might think it’s just clouds,” said Logan Johnson, a meteorologist with the National Weather Service’s Seattle office. The downpour of salt-and-pepper ash, he added, is like “nothing we’ve observed in quite some time.” The Diamond Creek Fire...has scarred about 105,000 acres of north central Washington and crossed into Canada; the Norse Peak Fire has scorched almost 45,000 acres near Mount Rainier. Fascinated locals have snapped photos of the strangely colored skies and rubbed their fingers across their vehicles until they turned dark with soot — as if to prove that the bizarre conditions were real. The National Weather Service has put out air quality alerts warning of unhealthy conditions in Portland and Seattle...*

*—Matt Stevens, The New York Times, September 6, 2017*

*This is just one event in the current onslaught of climate related disasters in this State. I highlight this issue here as both a long-time Washington resident who has observed the acceleration of these impacts, and someone who cares deeply about working towards change.*

Climate change is both an immediate and looming threat. The politicization of it and the magnitude of its impacts make it a difficult topic to discuss. Not only is it challenging to comprehend the science behind the interrelated causes and impacts but it is also difficult to understand the radical behavioral changes that individuals must undertake in their lifestyles.

In the last three decades, Washington State has experienced higher temperatures than any other time since the start of the 20th century (Frankson et al., 2017). These trends are directly related to global climate change (Adelsman & Ekrem, 2012). As a result the State is now experiencing a variety of climate change-related effects including increased extreme heat events, droughts, wildfire, flooding, ocean acidification, rising sea-levels, and endangerment within the State’s ecosystem (Adelsman & Ekrem, 2012; Pendergrast et al., 2019; UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and

Centered, & Urban@UW, 2018). These will only increase as carbon emissions rise, and as a result human health and wellbeing is now or will be negatively impacted (UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, & Urban@UW, 2018). The Washington State government is working on informing the public on this issue; this includes a statewide initiative for curriculum in public schools to include Next Generation Science Standards and climate science to educate about this challenging topic (Frankson et al., 2017).

To galvanize these efforts, individuals and communities in the State can take steps to mitigate and become resilient to the effects of the climate crisis. Museums have a role to fill for their community and museum professionals are recognizing their value and stake in the climate crisis (Cameron & Neilson, 2015; Janes & Grattan, 2019). Museums center their missions around education (Janes & Grattan, 2019). They are unique institutions with innovative tools of communicating and a variety of modes through which they facilitate learning (Janes and Grattan, 2019). This includes imaginative exhibits, events, and educational programs led by passionate and creative museum staff and volunteers. The climate change engagement practices occurring or in the works at some museums appear as educational programs in which visitors can meet scientists and discuss the topic (Carnegie Museum of Natural History, 2019; “Establishing a learning network to connect museums; Nash & Brown, 2019). Others may appear as educational programs to teach about sustainable living through historic methods of farming and gardening as a resiliency method against the effects of climate change (“Farm,” n.d., McCallum, 2018).

While several publications and news articles have reported on ways in which larger museums locally and globally have engaged on this issue, there is limited information on how small and mid-sized museums discuss climate change (American Alliance of Museums, n.d.;

Coalition of Museums for Climate Justice, n.d.; Museums & Climate Change Network, n.d.; Sutton, 2019a). It is well known that the impacts of climate change are a function of the geographic location and local decision making (Intergovernmental Panel on Climate Change, 2018; Mearns & Norton, 2010; UW Climate Impacts Group et al., 2018). This makes for a perfect engagement opportunity for smaller regional museums.

The purpose of this study is to explore the dimensions of community engagement on topics related to climate change, in small and mid-sized museums in Washington State. A case study approach will be used to answer the research questions below:

- 1) In what ways do small and mid-sized museums in Washington State engage their communities on topics related to climate change or environmental impacts?
- 2) What were the barriers and opportunities presented to these small and mid-sized museums in Washington State as they worked to implement engagement activities for their community on topics related to climate change or environmental impacts?
- 3) What is the perceived impact of climate change-related engagement on small and mid-sized museums' communities in Washington State?

### **Significance**

This research will benefit Washington State small and mid-sized museum practitioners, and perhaps others in different geographic areas who a) wish to engage and impact their communities in the context of climate change effects, adaptation, and/or resiliency, or b) have determined they are lacking relevance within their communities.

Broader significance lies in the implications about the accessibility of undertaking this work and may assist to increase the numbers of small and mid-sized museums in Washington that are doing this, further galvanizing efforts within the State to inform and prepare communities about climate change-related effects, risks, and hazards. A final broad significance connects to the local communities who, dependent on the approach of the local institution, may increase their efforts to understand, adapt, and act around the climate crisis.

## **Chapter 2: Literature Review**

### Climate Change and Washington's Natural Environment

In the last three decades, Washington State has experienced higher temperatures than any other time since the start of the 20th century (Frankson et al., 2017). These trends are directly related to global climate change (Adelsman & Ekrem, 2012). Direct or looming threats of climate change include increased extreme heat events, droughts, wildfire, flooding, ocean acidification, rising sea-levels, and potential endangerment or extinction within the State's ecosystem (Adelsman & Ekrem, 2012; Pendergrast et al., 2019; UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, & Urban@UW, 2018). Projections from the University of Washington Climate Impacts Group (2017) report that by the middle of this century the number of days over 90° Fahrenheit will increase by 67%, snowpack will reduce by 38%, streamflow in the summer will decrease by 23%, streamflow in the winter will increase by 16%, and sea level rise will increase by 1.4 feet (Snover, Raymond, Roop, & Morgan, 2019). The Washington State Department of Ecology (2019) showed that emissions in the State dropped 0.1 million metric tons between 2016 and 2017, which may indicate some progress due to climate-related legislative action (Washington State Department of Ecology, 2019). However, the overall trend shows growth of carbon emissions in the State over the last several years (Washington State Department of Ecology, 2019). Although the drop in emissions are encouraging, it may be premature to label it as evidence of progress.

### Climate Change Impacts and Human Health

Most relevant to this study is how climate change affects human health and wellbeing in the State, as motivation for action (Adelsman & Ekrem, 2012; Pendergrast et al., 2019; UW

Climate Impacts Group et al., 2018). Wellbeing as a broad term may pertain to economic or financial impacts. For all Washington communities and individuals effects include poorer air quality, changes in the spread of infectious disease, threats to existing infrastructure and livelihoods, access to water, and other factors that are detrimental to health and wellbeing (Adelsman & Ekrem, 2012; Pendergrast et al., 2019; UW Climate Impacts Group et al., 2018). For example, in 2015 Washington experienced the worst wildfire season in its written history, with more than one million acres burned (Snover et al., 2019). In recent years, Washington wildfires have caused significant property and environmental damage for people (UW Climate Impacts Group et al., 2018). Wildfires also caused hazardous air quality for communities throughout Washington due to the pollutants and particulates present in the air (United States Environmental Protection Agency, 2019; UW Climate Impacts Group et al., 2018). Additionally, individuals with preexisting respiratory disorders were highlighted as being at higher risk (Pendergrast et al., 2019; UW Climate Impacts Group et al., 2018); however, certain long-term health impacts due to exposure remain unresolved (Pendergrast et al., 2019; UW Climate Impacts Group et al., 2018). Communities also face depletions in the State's water supply, which are affected by changes in streamflow and related decreases in mountainous snowpack (Adelsman & Ekrem, 2012; Snover et al., 2019). While these examples provide an illustration of the hazards of climate change for Washington State communities, individual vulnerability and impact varies dependent upon their geographic location, preexisting health conditions, ethnicity, age, language, wealth, and livelihood (UW Climate Impacts Group et al., 2018). Due to the scope of this research, this study will not include all environmental changes in Washington.

### Perspective from the Museum Field

The museum field has joined in on the work of climate change researchers and educators as they recognize the profound challenges that global warming poses for humanity (Cameron & Neilson, 2015; Dichtl, 2018; Janes & Grattan, 2019; Sutton, 2019b). This includes both the physical effects on communities, as well as the complex behavioral shifts necessary to significantly reduce greenhouse gas emissions (Cameron & Neilson, 2015; Sutton & Merritt, 2015). A recent report from the Intergovernmental Panel on Climate Change (IPCC)(2018) provides that remaining at current warming of 1.5°C from global carbon emissions, requires cutting greenhouse emissions to 45 percent below 2010 levels by the year 2030; there is a narrow and shrinking timeframe in which humans can change the current trajectory. Increased temperatures of just a half degree more will put the globe’s population at high risk (Intergovernmental Panel on Climate Change, 2018).

Achieving goals to reduce human output of carbon will require collective social action like never seen before (Cameron & Neilson, 2015; Intergovernmental Panel on Climate Change, 2018; Vakalevu, 2018). Museums across the world are committed to this movement. Since its launch in 2017 the *We Are Still In* declaration has been signed by 68 cultural institutions along with more than 2,700 other American economic constituents including cities and counties, colleges and universities, healthcare organizations, businesses, tribes, and states (“We Are Still In’ Declaration,” n.d.; “Who’s In,” n.d.). Despite the United States’ announcement that it would pull out of the Paris Climate Agreement, museums have committed to continuing action in the climate crisis in line with the Agreement’s goals (“We Are Still In’ Declaration,” n.d.). Additionally, several museum climate advocacy organizations and networks have been created including the Coalition of Museums for Climate Justice, the American Alliance of Museums’

(AAM) Environment and Climate Network, the American Association for State and Local History's (AASLH) Task Force on Environmental Sustainability and Climate, the Museums and Climate Change Network, and more (American Alliance of Museums, n.d.; Coalition of Museums for Climate Justice, n.d.; Museums & Climate Change Network, n.d.; Sutton, 2019a).

### Museums and Public Trust

Museums are uniquely equipped to help rally the necessary community action at this crucial time (Janes & Grattan, 2019). Recent studies show that museums are considered to be highly trusted sources of information, far over government and corporate entities, as well as mainstream media (American Alliance of Museums, 2018; Dilenschneider, 2019).

Dilenschneider (2019) reported that in addition to trust, compared to entities such as newspapers and federal organizations, people believe that museums are credible and without political agenda.

However, while people may not see museums as having a political agenda, it is the opinion of several sources in the field that museums are not, and cannot be neutral (Dilenschneider, 2019; Fleming, 2016; Janes, 2015; Janes & Grattan, 2019; Sandell, 2016). Traditionally in the field, museums have positioned themselves as unbiased communicators of information (Orloff, 2017).

Though as sources provided above would say, this has simply not been the case for museums.

Fleming (2016) posed that people bring their own beliefs and biases to their institution's messages, whether they are conscious of it or not—all museum interpretation is inherently biased. While many museums still hold onto this belief in neutrality, Janes and Grattan related this idea of neutrality to the state of remaining unchanged, "To hold a museum static, while the values of individuals and communities are changing, is to doom the museum at a time when individual and societal values are in great flux" (2019, p. 98). Wood's (2018) Thesis Study,

though a small sample, demonstrated that museums can maintain public trust while providing non-neutral messaging.

### Museums and Social Justice in the Time of Climate Change

Museums have a responsibility for their communities to join in the climate action movement. Climate change is about many things, but a core element is how it affects people (Intergovernmental Panel on Climate Change, 2018); climate action is a matter of human rights and social justice (Intergovernmental Panel on Climate Change, 2014; Janes & Grattan, 2019). The IPCC stated, “Environmental issues are interwoven with the fabric of racial, social, and economic injustice. Environmental costs and benefits are often distributed so that those who already suffer other socio-economic disadvantages tend to bear the greatest burden” (2014, p. 294). They also highlight that equitable shares in the duties of climate action are necessary to match the significant effect that climate change causes (Intergovernmental Panel on Climate Change, 2014). In the section above it was discussed that museums maintain a high degree of public trust; Janes and Grattan (2019) pointed out that museums must respect the high esteem that the public places on them by recognizing the social justice component of climate change, and positioning themselves for their communities who are, or will be affected by the climate crisis. Cameron et al. noted that museums have been given authority and social standing by the public and, “Achieving real change needs real pressure, exerted on those with effective power” (2013, p. 19). Given these institution’s authority and public trust, their messaging helps to create the political and moral atmosphere (Cameron et al., 2013; Janes, 2019; Sandell, 2016); in this there is a social duty for museums to address climate change and action, especially since there has been insufficient leadership from local, state, and federal policymakers and government bodies (Cameron et al., 2013).

In a similar vein, perhaps more in the practical realm rather than the theoretical, museums gain part of their funding from public charity and public tax dollars (Bell, 2012; Manjarrez, Rosenstein, Colgan, & Pastore, 2008; Sutton, 2019c). AAM's study showed that of the four categories of museum income, approximately 38% is due to private donors such as individuals and charitable organizations, and about 24% is from government funds, aka public tax dollars (Bell, 2012). While museums are increasingly providing their own earned income to this pool, they are fiscally supported by people (American Alliance of Museums, 2018; Bell, 2012).

#### Museums and their Unique Points of Connection

In addition to their public trust and social duty, museums are uniquely situated to work with their communities on climate action due to several other qualities (Cameron & Neilson, 2015; Janes & Grattan, 2019). Janes and Grattan (2019) assert that museums are one of the most unrestrained and creative places to work, and that out of all institutions including businesses and government, museums explore the questions of humanity. This is a notable point as some sources say it will require this manner of effort to address the complex problem of anthropogenic climate change (Cameron & Neilson, 2015). Museums have a variety of modes through which they communicate (e.g. exhibits, activities, events, programs, and immersive opportunities) and through this flexibility have the ability to help shape their communities knowledge and perception (Cameron & Neilson, 2015). They also have access to scientific partners and new research (Museums Association, 2013). Museums provide public accessibility as place-based centers, positioning them to address local issues (Janes, 2009, 2019; Jennings, 2019). As the knowledge on climate change continues to expand and change, flexibility, creativity, access to knowledge and access for people are prudent. While there are undoubtedly many more benefits

to museums that are not listed here, this is to provide a glance as to why professionals in the field believe museums can and should join the climate action movement.

### Museum Strategies and Climate Change

Museums are approaching the topic of climate change in two primary ways: 1) mitigating carbon output and prepping the museum structure and 2) through education and engagement. In the first of these, museums are mitigating their carbon output and prepping the building for a climate sensitive future by reducing the waste they generate, using more sustainable energies like LED light bulbs, reducing water consumption, and through general “greening” of the building (Brophy & Wylie, 2013; Sutton, 2015). This may also be utilized as a form of “teaching by example” as staff can interpret these actions for visitors or utilize signage around the space to inform guests of their shift to support sustainable practices (Sutton, 2015). Related is the idea of preparing the space for the challenges that an unstable climate can bring about (Anderson, 2012). While Anderson (2012) specifically relates this idea to schools, it may be applied to museums as informal learning environments, since this idea is aimed at making a learning environment safe and stable to secure the continuity of educational practices there. While environmentally sustainable practices are not the main focus of this work, institutional reduction of carbon output and interpretation of that may appear as part of the strategy museums utilize in later case studies in this research. Other sources however point to education or other forms of engagement as a primary focus to create the necessary collective action of people in the climate crisis (Cameron & Neilson, 2015; Geiger, Swim, Fraser, & Flinner, 2017; Intergovernmental Panel on Climate Change, 2018).

### Washington State and Climate Science Curriculum

Washington State supports utilizing education to inform the public for climate action (Adelsman & Ekrem, 2012; OSPI, 2018; Ruskey, 2018). Throughout the State's document *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy*, education is highlighted throughout, as well as notes on communication and outreach on the topic (Adelsman & Ekrem, 2012). In 2018, Washington signed the ClimeTime initiative, providing \$4 million dollars in funds to K-12 schools for climate science learning with intentions to empower young people and school's communities by providing the tools and knowledge to become resilient to the changing climate (OSPI, 2018; Ruskey, 2018). Efforts like the ClimeTime initiative may help to support museum educators and interpretation of this subject, as climate literacy encourages action and adaptation (Intergovernmental Panel on Climate Change, 2019).

### Climate Change Education

The modes of climate change education are generally non-uniform, in-flux, and often bundled with other related pedagogies such as environmental education or education for sustainable development (Anderson, 2012; Board on Environmental Change and Society et al., 2012; Chew Hung, 2014; Hulme, 2018). One area that has remained most constant however is climate science literacy which is being implemented as part of ClimeTime in Washington. Climate literacy principles agreed upon by the National Oceanic and Atmospheric Administration (NOAA) and the American Association for the Advancement of Science (AAAS) (2009) aims for individual understanding of the globe's climate system, ability to critique scientific information that is presented, communication about climate change, and making informed choices. However, Shwom et al. (2017) argued that climate literacy is not enough, and

requires the integration of social sciences, such as the political and economic stakeholder-relations and impacts on the climate for populations to gain a holistic view of and decision-making abilities as they confront climate change. Other common areas of climate change education, whether they be defined as such, are mitigation and adaptation (Anderson, 2012; Chew Hung, 2014); mitigation aims to reduce greenhouse gas emissions, while adaptation follows the thinking that climate change is on a trajectory which can only be mitigated or avoided to an extent (Anderson, 2012). Adaptation practices, as defined by Anderson, is “...reducing the vulnerability of natural and human systems to the impacts of climate change and adapting to a changing climate through adjustments in social, ecological or economic systems” (2012, p. 192). Other sources like Russ and Krasny (2017) look at similar approaches to climate change education but in terms of reclamation (like mitigation) or reclaiming lost ecological systems through human initiative, resilience (similar to adaptation) or networks of collaborative information sharing for adaptation, and regeneration or new systems of knowledge and stewardship. In this view these three “R’s” include mitigation and adaptation learning but provides that it is necessary to use terms which foster a shift beyond current perspectives and political parameters which support environmental and social inequity (Russ & Krasny, 2017). Several of these sources appear to imply a need for a multi-disciplinary and/or a humanities-based approach and stake in the topic, as the complexity of climate change requires modes that can make it accessible and relatable to the public.

#### Community Engagement and Communication on Climate Change

Community engagement and communication on the topic of climate change is an area where museum talents can shine in the climate action movement (Cameron et al., 2013). The Board on Environmental Change and Society noted:

Informal learning institutions can crystallize knowledge in ways that excite people and inspire them to act, which is critical to advance the broader goal of creating a generational shift in people's connection with the environment...goals are ultimately about stewardship and people taking responsibility, not just individually, but as social actors. (2012, p. 12)

While education and an informed public are central to addressing the climate crisis, engagement and communication as an avenue for climate change action goes beyond this (America's Climate Choices: Panel on Informing Effective Decisions and Actions Related to Climate Change, Board on Atmospheric Sciences and Climate, Division on Earth and Life Studies, & National Research Council of the National Academies, 2010; Cameron et al., 2013; Intergovernmental Panel on Climate Change, 2018). However, there is not a uniform definition or understanding of what climate change engagement and communication are. Some sources describe it similarly, where education implies a one-directional transfer of information, communication implies a dialogue which means it may address the complexities of climate change comprehension, such as accounting for an individual's values and perceptions in the conversation (Cameron et al., 2013; Cameron & Neilson, 2015; "What is Climate Change Communication?," 2015). Hodge describes communication in terms of both this unidirectional transmission called the "deficit model" as well as that of "multi-modality" which relates to the concept of dialogue (Cameron & Neilson, 2015, p. 136, 150); though he remarks that there are some areas lacking in a dialogue model as it may not allow for all voices on the issue, so he asserts that a triologue mode is most ideal as it can articulate the relationship between museums, other experts, and the public as a strategy towards climate action, and to take on the role of "management" of climate change given the uncertainties of how and to what degree climate change will continue to manifest, versus "control"—or traditional unidirectional information transfers, which has only encouraged public retreat from the issue (Cameron & Neilson, 2015, p. 136,150). Finally, Geiger et al. noted that,

“Robust engagement with topics such as climate change involves being engaged on multiple dimensions: cognitive engagement (e.g., greater understanding about the topic), affective engagement (e.g., feeling hopeful about the possibility to contribute to solutions), and behavioral engagement (e.g., taking action within one’s community)” (2017, p. 223). For the purposes of this work, climate change engagement and communication at museums will be described as the multi-dimensional modes through which an individual or community is engaged on the topic of climate change.

### Museum Models and Climate Change Communication

Given the unique abilities museums possess to effectively engage their public, the current educational approaches to the topic, and the lack of clarity about climate change engagement and communication in museums, how are climate change engagement and communication expressed in museums currently? Some of this work appears to be occurring through partnerships such as the National Network for Ocean and Climate Change Interpretation (NNOCCI) trainings for museum professionals to more effectively communicate climate change, and the Carnegie museum’s partnership to bring science education to rural communities (Carnegie Museum of Natural History, 2019; “Establishing a learning network to connect museums, scientists and rural communities to discuss scientific information to inform transdisciplinary problem-solving,” n.d.; Geiger et al., 2017; Swim, Geiger, Fraser, & Pletcher, 2017). The Museum of Science, Boston has a similar program to connect communities to scientists (Nash & Brown, 2019). In addition to this they have also partnered with their local community for conducting citizen science studies to measure extreme temperatures (Hostetler et al., 2019). Locally, the NOAA reported the partnership between the Woodland Park Zoo, Seattle Aquarium, and the Pacific Science Center who launched the Seattle Youth Climate Action

Network which, “...empowers teens to address climate change in their communities through education, leadership, and action” (2015). Since 2015, over 500 teens have engaged in a variety of climate action related activities in the community (Woodland Park Zoo, 2019). Another local look is at the Museum of Northwest Art (MoNA) in La Conner, Washington. MoNA in 2018 held the exhibit SURGE which brought together artists and scientists to illustrate their perspectives on the future of communities as extreme water-related events increase due to climate change. La Conner is located in an area highly prone to flooding and will likely experience greater frequencies of these (Museum of Northwest Art, 2018; “Surge Exhibition Partnership,” 2018). Through partnerships and collaboration these museums appear to be focusing their efforts on and for their communities, whether that be through improving communication of the topic through staff trainings, providing higher quality climate science to rural communities, facilitating youth climate action, or allowing access to visions of the future to motivate mitigation/regeneration and adaptation/resiliency strategies.

At present there is limited literature about climate change engagement in museums and audience impact. However, comparisons between audiences at non-participating and participating institutions with the NNOCCI training one year after their visit provided several visitor outcomes including increased comprehension and concern about climate change as well as a willingness to discuss it and to take action (Swim et al., 2017). However, a limitation to this study is that samples were taken primarily at zoos and aquaria, and training sites were not chosen at random (Swim et al., 2017); it is likely that institutions who participated may already be in strong support of the topic. In a similar NNOCCI study it was found that the utilization of messaging which transcended the politicization of the topic, resulted in improved comprehension and intention for action regardless of visitors’ political values (Geiger et al., 2017); further the

researchers of that study believe their results indicate that informal learning institutions can have wide impact and has indications for collective action, especially as the results were consistently noted over the four-year study (Geiger et al., 2017). Finally, the Renaissance Program East described visitor responses to sustainability engagement at several rural museums including understandings about the complexities of food production, and the comparisons between trash from today and archaeological “trash” (Renaissance Program in East of England, 2010). Though limited, these audience impacts can help to provide a touch of the tangible effects of climate change topics in museums.

### Opportunities for Smaller Regional Museums

According to the findings of this research, most studies about museums and climate change appear to occur primarily through larger institutions—though some smaller or mid-sized institutions have been mentioned thus far in this work. Herein lies some implications for smaller institutions as an untapped resource. Provided are a few definitions of small and mid-sized museums to contextualize what these sizing terms mean; it appears that often the definitions of these two may be grouped under the umbrella term of small. According to AASLH small museums are those that:

...have an annual budget of less than \$250,000, operate with a small staff with multiple responsibilities, and employ volunteers to perform key staff functions. Other characteristics such as the physical size of the museum, collections size and scope, etc. may further classify a museum as small. (n.d.)

Additionally, they mention that museums may personally define and situate themselves within the smaller museum category (The American Association for State and Local History, n.d.). The BBK Mapping Museums Research in the United Kingdom notes that a museum’s size is usually determined by the quantity of visitors they receive in a given year and found that small museums receive up to 10,000 while mid-sized numbers are 10,001 to 50,000 (2018). While limited

definitions of these terms appear in the literature, the information above may provide context for the rest of this section and later case studies.

A conference at the beginning of 2019 by the American Alliance of Museums' Environment and Climate Network and Historic Houses and Sites Network provided a view of enthusiasm in the smaller museum genre, though not all historic sites, or house museums for that matter may be considered small (Hawkins, 2019). The symposium, Sustainability: Governance, Relevance, and the Environment provided that due to the high number of museums in this category—approximately 48% of all museums in the U.S. fall into this category, along with their access to history, can have a significant impact (Hawkins, 2019). The AASLH organization, of which many small museums are members, is leading this work in the genre as signatories of *We Are Still In* and their Task Force on Environmental Sustainability and Climate (Sutton, 2019a; “Who’s In,” n.d.).

Location is an important factor to climate change. First, this is due to the variability of climate effects which are dependent on the geographic location (UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, & Urban@UW, 2018); one community may experience coastal degradation and sea level rise, while inland communities may have greater exposure to the detriments of wildfires. In Washington the UW Impacts Group has identified three major geographic locations, the wildland-urban interface, urban areas, and floodplains (UW Climate Impacts Group et al., 2018). In the wildland-urban interface, wildfire is a major concern, while the floodplains can expect an increase in flooding in the future as well as other related effects on water quality, and finally, urban areas can likely expect poorer air quality and more extreme heat in the summer due to the

high quantities of concrete and asphalt in the city (UW Climate Impacts Group et al., 2018). These local geographically based concerns are either immediate or looming.

Second, Mearns and Norton reported that rural local institutions are sources of leadership for communities and can, "...facilitate or impede individual and collective responses, and shape the outcomes of such responses" (2010, p. 174,180). They noted that often these institutions can serve as "mediating mechanisms" and facilitators through which outside sources can provide support to community adaptation practices (Mearns & Norton, 2010, p. 174). The IPCC also appear to indicate some of the importance of geographic location as it pertains to locally based action, "Education, information, and community approaches, including those that are informed by indigenous knowledge and local knowledge, can accelerate the wide-scale behavior changes consistent with adapting to and limiting global warming to 1.5°C" (2018, p. 24). With highly localized support it may be possible to inform community action.

Two smaller museums outside of Washington, the Wyck Museum and Montgomery's Inn may provide a view of what climate change communication may look like in a smaller institution. The Wyck Historic House Museum in Philadelphia utilizes their historic farm to promote environmental sustainability ("Farm," n.d.). They use chemical-free cultivation methods, as well as historic hand-powered tools, and they also hosted a weekly farmers market ("Farm," n.d.); though as of this writing, the latter is not currently operating ("Farm," n.d.). Often serving as an outdoor classroom, the work of the Wyck's farm has sought to communicate both environmental science and the history of farming aligning them with their history-based mission ("Farm," n.d.). Montgomery's Inn is another historic house museum which also utilizes their farm to provide programs about gardening and growing one's own food in efforts to nurture

visitors' relationship to the land, and introduce visitors to what it means to take on a stewardship role (McCallum, 2018).

Considering the Washington State ClimeTime initiative and the evidence of localized messaging, provides an intriguing opportunity for small and mid-sized museums in Washington State to engage and impact their communities regarding climate change. Herein are potential implications for widespread climate action situated between the two hundred-plus small and mid-sized museums in the state (American Association of Museums & NRP Direct, 2018, p. 2033). However, there is little data about how these smaller museums in the State are approaching the work of engaging their communities around climate change.

#### Museums and Potential Barriers to Climate Change Engagement and Communication

Some museum professionals have expressed several barriers, whether proven or perceived, to engaging their audiences on the topic of climate change. Some professionals have mentioned feeling a lack in appropriate expertise to communicate on this topic (Geiger, Swim, Fraser, & Flinner, 2017; Orloff, 2017; Sutton, 2019c; Swim & Fraser, 2013). This is due to two overarching factors: feeling confidence in personal understanding and of framing climate change appropriately for visitors, as well as concerns about politicization and public beliefs (Geiger et al., 2017; Orloff, 2017; Sutton, 2019c; Swim & Fraser, 2013; Swim, Geiger, Fraser, & Pletcher, 2017). Addressing the concept of confidence, Sutton (2019c) countered that there have been many other challenging situations—decolonization, social media, and the internet—in which museums rose to the task and made the appropriate shifts by learning, sharing information within the professional realm, and employing those with the suitable knowledge. The NNOCCI study mentioned previously provided educator trainings specifically aimed at inspiring action (Geiger et al., 2017); the study found that after attending trainings educators felt more confidence in their

ability to appropriately communicate with visitors about climate change (Geiger et al., 2017). In these trainings core elements of climate change messaging included linking audience members perception with the necessity for climate change engagement, utilizing metaphors and simplified models to improve the accessibility of the information, as well as active encouragement for visitors to talk about climate change in other settings (Geiger et al., 2017; Swim et al., 2017). Support and resources are available to museum professionals through the numerous museum climate advocacy groups and networks mentioned previously in this chapter, as well as other national, and international organizations such as the One UN Climate Change Learning Partnership (UN CC:Learn) which seeks to, “...design and implement systematic, recurrent and results-oriented climate change learning” (n.d.). While this is primarily geared towards larger-scale national and international climate change education efforts, the UN CC:Learn also provides a suite of resources available online, and could be especially useful for those with limited resources (The One UN Climate Change Learning Partnership, n.d.).

Politicization and public beliefs about climate change are also considered potential barriers to communication (Geiger et al., 2017; Swim et al., 2017). Some have felt a lack of institutional support, due to the topic’s often polarizing effect (Swim et al., 2017). While others perceive that some audiences would not be able to effectively engage with the topic due to personal beliefs (Geiger et al., 2017). Messaging techniques which focus on the social meanings of climate change provide avenues through which to engage audiences, whether they are politically aligned with climate change science or not (Geiger et al., 2017). Additionally, the Yale Program on Climate Change Communication recently released a report which provided statistics on American beliefs about climate change (Leiserowitz et al., 2019); they noted that 69% of Americans “think” climate change is happening, while 46% are “certain”, and 69% are

concerned about harm from extreme climate-related events (Leiserowitz et al., 2019, p. 4). This implies that larger portions of audiences may be receptive to engagement on topics of climate change, especially if this is provided with care and consideration of the messaging technique (Geiger et al., 2017).

Professionals have also expressed concerns about funding. As mentioned previously, a proportion of museum funding is sourced from the public. Sutton's (2019c) opinion is that museums need to use those funds for public good and that means climate action. It is likely that a majority of funding for museums does go back into the community in many other ways; the argument here is that climate change is at the forefront of contemporary issues that people are now confronting or will. Similarly, Janes and Grattan (2019) bring up concerns that some donors may be lost due to shifts in climate-related engagement. However, opportunities may equally arise as these actions may provoke new donors with environmentally related interests (Sutton, 2015).

Lastly, another perceived barrier is remaining mission aligned. A brief definition of a mission statement comes from AAM, "A mission statement is the heart of a museum. It articulates the museum's educational focus, purpose, and role, as well as its responsibilities to the public and its collections" (2018, p. 1). Orloff's (2017) view is that museum staff's duties are already at maximum capacity with just their focus on areas that are central to the mission such as collections and interpretation activities; given this, it is not practical to take on a social justice role (Orloff, 2017). While it is likely clear how a science museum, zoo, or aquarium might be mission-aligned to address the topic of climate change, how can a history, art, archaeological, or other cultural institution engage in this topic while remaining committed to their mission? Education is at the center of the museum mission (Janes & Grattan, 2019). Janes and Grattan

stated, “...so we must ask what sort of education is appropriate and necessary now?” (2019, p. 101). Some historic house museums have established avenues for addressing climate change while supporting their mission, and this includes utilizing their historic gardens or farms to teach visitors about growing their own food, or zero carbon-output practices and tools for doing so, and even greening their institution’s physical building and staff practices (McCallum, 2018; “Strawbery Banke Museum – Preserving the Past with a View to the Future,” n.d.; Sutton, 2015).

McCallum highlights how these techniques are meant to work and their effect on visitors:

For most of history, humans from all over the world were deeply connected to the food they ate. Because of the role and relationship people had with food, they had a better, almost innate understanding of basic earth sciences. You had to know which direction the sun rose and what qualified as “good soil”. When you understand what the earth requires to give you the nourishment you need, the relationship become symbiotic and taking care of the planet in other ways, be it transportation, water consumption, or energy saving, becomes naturally instinctive behaviour. (2018, paras. 5–6)

Additionally, in the history museum genre Dichtl (2018) pointed out that climate change is a *matter* of history, and these museums are well-suited to address this; this may be through discussion of past ways of living that demonstrate a more sustainable way of life or the ways that behaviors in the past, like consumerism, have impacted people today (Dichtl, 2018; Sutton, 2015). Museums also have a duty to protect their collections, and climate change will alter how institutions can continue to care for these (Dichtl, 2019; Janes & Grattan, 2019). In short, if education, collections, or representing the past are a part of a museum’s mission, addressing climate change can galvanize that alignment.

### Literature Review Conclusions

There is evidence from the literature that geographic location has a role to play in communicating on this topic, and as place-based centers so too do museums (The Intergovernmental Panel on Climate Change, 2018; UW Climate Impacts Group, UW

Department of Environmental and Occupational Health Sciences, Front and Centered, & Urban@UW, 2018) Washington's ClimeTime initiative provides an intriguing connection point for museums and this movement in their local communities. Through their contributions to society, museums have gained a great amount of public trust and following (Janes and Grattan, 2019)—they may help to lead their community in action. It is of profound importance that everyone be involved in the climate action movement. Climate change is a matter of social justice, and museums have the tools and the networks available to help them address the topic for the benefit of their communities.

### **Chapter 3: Methods**

The purpose of this study was to explore the dimensions of community engagement on topics related to climate change in small and mid-sized museums in Washington State. Three research questions governed this study:

1. In what ways do small and mid-sized museums in Washington State engage their communities on topics related to climate change or environmental impacts?
2. What were the barriers and opportunities presented to these small and mid-sized museums in Washington State as they worked to implement engagement activities for their community on topics related to climate change or environmental impacts?
3. What is the perceived impact of climate change-related engagement on small and mid-sized museums' communities in Washington State?

This research was conducted using a case study design. Data were collected through structured interviews with museum professionals from museums that appeared to engage with climate change or environmental impact topics. When available and applicable, this study attempted to gather other data such as evaluation reports of the museum's audience members when engaging with these topics, as well their strategic plans, annual reports, social media, and website information. This chapter details the sampling, data collection, analysis process, and the limitations of this research.

#### **Sampling**

Museums were identified through a comprehensive list of Washington State museums, their website or social media descriptions of their content, and number of staff members. Six small and mid-sized museums were identified based upon the quantity and/or quality of their content (e.g. exhibits, special events, and programs) pertaining to the topics of climate change or

environmental impacts. This topic is difficult to address and present, not only due to the challenge of discussing it among populations, but also its broad reach of impact on societies, humanity, and life on this planet. This broad reach required that research also identify museums that mention environmental conservation. To be clear this is not the focus of this study.

However, as the data will show, it is challenging to discuss climate change without the mention of environmental conservation. Museums were drawn from a variety of genres including aquaria, art, history, science, cultural and interpretive centers. The researcher's goal was to interview four to six museum professionals. Of the six contacted, all agreed to participate in the study.

Museums were anonymized due to the sensitive nature of this topic and to allow for freer commenting by participants should they feel concerned about speaking to this often politicized topic and alienating community members or fellow museum staff and volunteers.

Museum 1 (M1) is a small art museum in the Northwestern part of the State. This museum has educational programs that focus on climate change-caused increases of flooding, a specific concern for their area. This museum has also had a successful exhibit on this same topic.

Museum 2 (M2) is a mid-sized, regional history museum and interpretive center in the Eastern part of the State. It has exhibits and school programs pertaining to the history, culture, local river system and surrounding natural environment in the area. They utilize the educational foundations of STEAM (science, technology, engineering, art, and mathematics) within their content. This museum describes climate change within the local environment, through indirect language due to the politicization of climate change.

Museum 3 (M3) is a small aquarium in Western Washington. This museum has an abundance of exhibits and educational programs on the topic of climate change and environmental impacts. Their focus is primarily directed at the impacts of climate change on the

health of the Puget Sound and surrounding communities through topics such as ocean acidification and sea level rise.

Museum 4 (M4) is a small interpretive center in Eastern Washington. This museum focuses on natural history, environmental understanding, and Indigenous history in the area. Their content includes exhibits and programs on bees, salmon restoration, general nature conservancy, and climate change impacts in the local area.

Museum 5 (M5) is a small marine history museum in Western Washington. This museum has an abundance of exhibits, programs, and special events on salmon conservation, and sea-level rise. In addition to these efforts, this museum also partakes in other climate change-related activities to prepare their own space as well as the local community infrastructure for the impacts.

Museum 6 (M6) is a small to mid-sized regional museum in Eastern Washington. This museum focuses on the history, art, and science of the region. They utilize STEM (Science, Technology, Engineering, and Math) within their education and have had special events and programs that grapple with the topics of climate change and environmental impacts.

Primarily the researcher identified heads of the educational departments at each institution. Given the staff capacity at some museums, there were limited options as to potential participants. In these cases, the researcher was directed to participants in other roles. Job titles and roles varied by institution and included an Education Coordinator, Education Director, Education Manager, Education and Volunteer Coordinator, Curator of Education and Programs, as well as a member of the Board.

**Data Collection**

Data were collected primarily through structured interviews, along with publicly available annual reports and strategic plans, social media, and website information. None of the participants were able to provide an evaluation report of their programs or exhibits, however a few described some of the highlights of informal evaluation. The researcher contacted participants through email (see Appendix A), and conducted interviews using the Zoom video service. Participant consent (see Appendix B) was given prior to the interview. The questions (see Appendix C) were tailored to understand the types or themes of their content related to climate change or environmental impacts, the barriers or opportunities of communicating this topic, as well as documented or personal views about the impacts of this content at their museum. Each interview lasted between 30 and 75 minutes; the outlier being the latter.

**Data Analysis**

Except for some minor editing, all audio recordings were automatically transcribed through the Zoom service. Through the participants' personal perspective, the purpose of this was to understand how each institution converged or differed in their support structure for the topic, communication, and audience or community impact on the topic of climate change or environmental impacts. Some of the information gained from these interviews could be supported from analysis of public information such as the aforementioned documents, the availability of which varied between institutions. The researcher identified themes for each research question through emergent coding (see Appendix D).

**Limitations**

Due to the guidelines of the University of Washington Research: Human Subjects Division, museums could not be contacted by the researcher prior to study approval through the

University's Institutional Review Board. This meant that the researcher could neither confirm nor gain further knowledge about potential sites and their climate change or environmental impact related activities, except for what was available on their website or social media content. While those that did participate undoubtedly provided valuable information for this research, it is possible that sites could have been overlooked due to lack of in-depth information available online. Finally, the availability and variability of other supporting public documents or information impacts the extent to which this study can support some of the information gained from interviews.

## Chapter 4: Results

This chapter summarizes the results of this research study, which is organized by research question then correlating themes and sub-themes that emerged from analysis of both participant interviews and publicly available institutional documents.

### **RQ1. In what ways do small and mid-sized museums in Washington State engage their community on topics related to climate change or environmental impacts?**

Four themes outline the ways that small and mid-sized museums in Washington engage their community on these topics: 1) they are multimodal; 2) utilize science-based communication; 3) utilize place-based climate change communication; and 4) empower individual action and/or resiliency.

#### Multimodal

Through either interview responses, website, or social media content, each museum described the following modes through which they engage their community on climate change. These include exhibits, educational programs, and events. Additionally, these modes had elements of either hands-on, visual, verbal, or a combination of these to communicate the content.

Participants described using these modes as a platform through which to reach people on the challenging topic of climate change. M4 stated, “I think there has to be a variety of different approaches, and so I think having lectures and exhibits is a really good way to do it, but I think combining them with some other ways to reach people is important as well.”

M3 described the benefit of using hands-on and visual approaches like experiments to describe the science of climate change. For example, in an experiment, what will be called here

“The Island” experiment, students are invited to create their own island and set it afloat in a bucket of water. The facilitator then pours ice into the bucket to demonstrate how global warming affects the ice caps. In this hands-on and visual capacity, students can see in real time how global warming translates to sea-level rise and the impacts on life.

M1, M4, and M5 described utilizing exhibits to immerse visitors in the experience of climate change impacts which include increased floods, mudslides, and fires. M1 provided that in one exhibit, a tall fabric installation secured around the room high above the heads of visitors illustrated how increases in flooding and sea level rise will appear in their region.

M1, M3, M4, M5, and M6 described utilizing events through which to communicate on this topic. Events held by the participant museums included festivals, lectures, environmental film series, and forums with local city government and scientists. M6 hosts a monthly environmental film series, which is fiscally supported largely by partners, to engage their community on relevant topics such as fast fashion and the promise of more sustainable clothing systems. M5 has been running a popular local event for several years which celebrates and teaches the importance of healthy salmon as a keystone species to the community, the ecosystem, and broadly the climate.

Much more of this content will be described in the following pages. The above is intended to serve as a baseline to describe only the structures in which participant museums communicate their climate change content.

### Science-based communication

All participants highlighted their use of science to describe climate change in their local environments. There is a connection here between science-based communication of climate

change and the politicization of the topic, as these two themes often showed up in tandem during the interviews.

M1, M3, M4, and M5 described how science was used to explain the changes caused by climate change. M1 and M3 detailed science-based activities that provided students or visitors with visual and tactile comprehension of the topic. M1 utilized an activity to connect students to the local environment:

So, I went into their classrooms and we talked about native plants and riparian areas and how to keep the salmon cool. Basically, why the salmon like to be cool. Then we paired that in with the warm and cool colors and so each kid got a scale... I brought in a bunch of the actual native plants so they can kind of touch them and get to know them and then depict them however they want it on their scale. Then we had this huge mural with hundreds of the kid's scales that when they came into the museum for the first time, they got to see their art on the wall. So, it was a nice tie in for them.

M3 described using student water quality testing to teach children about pH levels and the human impacts on their local environment:

So, they've learned all about the estuary and everything that goes into it. Then they test our waters...our fifth graders are testing the streams all the way up to almost where the watershed starts. They go from the top of the watershed all the way out to the Salish Sea. They're seeing the environmental impacts that start way up, that have been harming our seas down here, and then trying to understand what might have gone into it. So, they're starting to understand these key parameters that go into sustaining life out there and then hypothesizing what it could have been that impacted it.

M4 described that the science of climate change in educational programming often occurs through the lens of ecology. He went on to note that the language may not be specifically focused on the active forces of climate change but more the immediate changes that have occurred as a result. M5 actively includes science in their programming according to their website content. While M5 did not detail the scientific aspects of their institution's programming during the interview, it was noted that scientific proof of the climate impacts in their local area is

regarded as a tool to transcend any politicization of the topic. This sentiment was shared or implied by M1, M2, M3, and M6.

Additionally, M1, M2, and M6 described utilizing volunteer scientists to come and speak with visitors or students. Each instance was structured for engagement opportunities between scientists and community members. Through partnership and collaboration between scientists and artists, M1 had various events in which the scientists could come and speak with visitors on the topic of climate impacts in their region. M2 fondly described using volunteer docents with a background in science to effectively reach many people from a variety of different backgrounds and beliefs. M6 utilizes a festival each year in which scientists can informally chat with community members on a variety of topics; though M6 did not provide specifics about how or how often climate change is discussed during these meetings.

#### Place-based climate change communication

Each museum communicated climate change through place-based narratives. While M1-M5 specifically described the changes to their geographic location due to climate change, M6 did not discuss this in their interview, however website content shows that the institution presents discussion of climate change impacts on local keystone species. Sub-themes present among the institutions are, presenting climate change as part of the story of the geographic location or, as a way of highlighting the impacts of climate change on the landscape.

M2, M4, and M6 described how climate change is part of telling the story of their local natural environment. M4 noted how the landscape and environment are already changing due to the impacts of greater wildfires claiming forested land and transforming it into grasslands, as well as smokier months which make it difficult to live in the area during those times; climate change is part of the local as well as educational narrative that the institution employs. M2

pointed out that one cannot describe the environment of the river system without noting the changes that are occurring; however, these changes were not described in the interview. M6, as will be discussed later in this research, is a site that appears to be in transition of including increased focus on climate change science. In describing one of their exhibit's content and its relation to climate change, M6 stated:

We're working that way. It's not 100% yet but we talk a little bit about it in one of our exhibits...it's backwards, because timewise it starts with the Ice Age, so it talks about climate change but it's kind of indirect. It doesn't specifically talk about why the Ice Age happened or ended.

Although M6 is in transition to discussing deeper concepts of current climate change impacts in their content, the above exhibit is not their only climate change-related content; as discussed earlier they also include direct language about this topic in their environmental film events.

M1-M5 each noted how they use the changes in the local environment to highlight the impacts of climate change. Both M3 and M5 highlight how the impacts of climate change affects the local economy. M3 described:

We really drill on ocean acidification as one of our main topics, because...shellfish production is a huge economy down here. One of our [companies] produces, I believe about \$6 million worth of shellfish per year...So with our ocean acidification exhibit, it talks about how calcium carbonate is slowly being changed with the ocean sinking in that carbon dioxide and it's changing that compound; so instead of calcium carbonate, it's carbonic acid now that's happening in our waters, and it's making the shells more brittle. So, these animals are becoming susceptible to diseases and to predation now that they are more readily broken into.

M5 on the impacts of salmon and the local fishing industry:

More importantly, when we have things like field trips or children's programming, we try really hard to discuss the fact that [the local area] was, when white settlers first came here (it's a story),...they would stand on [the bank], which is behind our building, and could literally reach out and grab a salmon out of the water. That's part of why it became such a successful fishing village was because the salmon were more plentiful...With the fishing industry, salmon became scarce behind us there. They closed off [the creek] and there was just a small culvert to allow the water to go through. So, the salmon stopped spawning, and about seven or eight years ago, the city opened the culvert. So now it's

actually a creek again and the salmon have started returning which is beautiful and magical. So, we try to tell that story in particular about you know, two different ways that we as people of [the city] have had a direct impact on the loss of salmon in our area specifically. We try to teach that and show that to kids, you know, so that they understand not only the history of their community, but the impact that they individually have on the whole.

The above quote exemplifies how M5 shows human impacts on the ecosystem and climate in the form of the fishing industries impact on the salmon populations.

M1, M3, and M4 highlight specific geographic impacts of climate change or environmental impacts on the local landscape. M1 utilizes exhibits, events, and educational programs to bring to light the looming increases in flooding that will occur in their area due to climate change. As M3's geographic location can be described as a marine environment, they utilize many modes of communication about ocean acidification and sea level rise. M3 noted that in their educational programs, they can point out to the bay to provide a visual of how sea level rise will impact their shores and thus the city's infrastructure. M4 has had three exhibits which deal with local impacts such as mudslides and wildfires and provide answers as to why these impacts are occurring.

Finally, M2 described how their content surrounds a significant impact event on the local river system due to human activity and provided a note about place-based connection for climate action. The impact mentioned cannot be named or described here due to conflicts with maintaining participant anonymity, "So there's a big emphasis on protecting the river, the challenges and advances that have occurred with protecting the river...That's been my focus is just instilling a sense of place and a sense of pride in the history of this place."

#### Empowerment for action and/or resiliency

Participants M1-M5 all described intentions or ways in which they empower action and/or resiliency in their visitors. Two sub-themes that emerged and which often ran in parallel

with one another are the utilization of positive language and the concept of using the power of education to combat fear and inform action.

M1, M2, M3, M4, and M5 all described thwarting feelings of fear or overwhelm around the topic as they illustrated their hopes for empowering community action. M1 noted of their museum exhibit and related educational programming:

That was another piece for me, like how to have kids thinking about these things in a way that isn't really scary and really sort of demoralizing. So that was another thing I really liked about how the scientists kind of wove it in [the impacts of climate change] with artists; I felt like there was a huge message about resilience which you know, wasn't like they were sugarcoating things, but they were really focusing on that evolution and hope.

While M2 pointed out:

It's been my focus to show people why you really live in an amazing place, you know, and also just inspiring them to want to be involved in the future of the [environmental impact] efforts, because it's such an overwhelming topic that I think a lot of people around here just don't know quite how to address it. I think that's been kind of the guiding force, just tell the stories of this place and inspire people to want to invest in it and, you know, do something with the community.

M3, M4, and M5 specifically noted their belief or practice of utilizing education as the mode through which to address fear and empower action. M3 described:

...with the younger kids, I want them to become aware and not to be scared. That's a huge thing with our climate crisis that's happening right now. It's happening, but there's something we can do about it. It's not this daunting thing to, you know, be freaked out about and become depressed, because we're starting to see that. These kids are becoming depressed about the outlook on life because, you know, the world is collapsing, it's falling apart. So, we really want to educate them because that's the first thing to combating fear is education. And so, teaching them at a young age to do these simple different habits, these different tricks to everyday life that will make a huge impact overall... We want to educate them and give them enough information and courage and backing that they can actually go to adults, tell them what's happening...and sometimes, you know, adults will dismiss young children because they think they're too young, [that] they don't understand this; but these kids are coming up with these crazy unique ideas that can work. They can change, and so we want to give them that power.

Similarly, M4 stated:

I feel that it's important to do things in good positive ways, not trying to guilt trip people about how much carbon they're using, but kind of really focus on education and focus on

positive local solutions... activities that are going to highlight things that people can do both with changing their own patterns as those relate to carbon output and also ways for them to kind of to work on offsetting things, and also be looking as a community ways to be developing more resiliency...like we're not going to stop fire, but you can make it a little bit easier to live with fire. Yeah, they're all different strategies but it's obviously a super complex problem with no one answer.

**RQ2. What were the barriers and opportunities presented to these small and mid-sized museums in Washington State as they worked to implement engagement activities for their community on topics related to climate change or environmental impacts?**

Four themes exemplified the barriers and opportunities presented to participant museums:

1) politicization of the topic and communication; 2) partnerships and collaborations; 3) strong institutional support structure; and 4) varying opportunities.

Politicization of the topic and communication

All participants described the politicization of the topic and several sub-themes emerged. Some participants described that there was no local conflict with discussing climate change but discussed the politicization of climate change when asked whether there were any barriers to communicating about this topic or with community response to this topic. Four of six participants described politicization as affecting their communication of the topic or a concern about the community response to it. Three participants described how certain terminology should not be used when discussing climate change. It is also of importance to note that for all participant museums, a core element of their mission statements are people or their community.

Some participants, namely M4 and M6 described that there was no local conflict with speaking about climate change in their areas. M4 stated that their community was “pretty darn progressive,” and M6 noted a high level of community interaction with the topic through schools or the numerous environmental organizations in the area. However, M4 pointed out that they

believed there would be more issues in trying to discuss this topic with communities in a nearby area, and implied politicization through contrasting the nearby community with their local community's somber but positive reaction to addressing climate change. M6 described their awareness of holding a personal bias as it regards comfort around discussing climate change:

It's very interesting for me. I'm coming from the south, and you don't talk about climate change. If you want to ensure that you will have community backlash, possibly even protests and a sure-failure of an event, you focus on climate change. I think that's because the South is so red in terms of politics. So I think that's where that comes from...For my perspective, I come out here and I'll say, "hey, can we say that?" and they're like, "Yeah"...So I have a different perspective, because to me, I don't really see that we have any barriers because we can talk about it, we can have the environmental films, you know? We don't have to worry about people getting all upset because we talked about climate change or related something back to climate change.

M1, M2, M3, and M5 all described how their communication is affected or shared a concern about discussing climate change impacts due to the political beliefs surrounding it. M1 described concerns about how parents or school leaders would respond to their children's learning about this material, implying a contrasting belief system in some community members. However, this was not an issue. M2 appeared to be the most challenged in speaking to this topic, not only in the interview but with their community due to perceived political leanings:

Okay, so one barrier that comes to mind, especially, you know, since you bring up climate change. The community here tends to be more on the conservative side. Especially in the past few years, there's kind of been a resistance to addressing that head on. So, one of the barriers we have is just being respectful of the pride in the history of this place and not wanting to seem like an outsider. You know, coming in and talking about difficult topics. So, a lot of times the things we talk about, we just don't do [it in] an overt way.

M2, as a science institution, discusses human impacts on the environment in a variety of ways, and through this indirectly attempts to relate to a changing climate. M3 described a generally progressive community, however noted that there are many community members with which there must be more steps towards making a climate change connection. M3 noted that in order to

begin this conversation, that they must first build an empathetic situation in which those community members can connect to the urgency of this problem. In this example, M3 provided that sometimes a local beloved species like the orca whale or salmon could be utilized to make that emotional connection with individuals to better describe and connect the climate impacts on those animals. M3 went on to include how one may build from there and provide deeper connections to how a changing climate affects an individual; essentially, if this animal is affected in this way, how might that translate to you? M5 noted similar issues with community members; they implied that the community held a political bias around the museum's presentation of climate change content in relation to overfishing and salmon health. M5 described the community views as misinformation or misconception.

Finally, M1, M2, and M3 all described terminology that they were advised on or believed should not be used when engaging community members on the topic of climate change. M1 described a conversation with an important partner when discussing a climate change art piece. In this conversation they were advised that they should not utilize terms like climate change, due to its likelihood of alienating community members. It was implied that these community members may hold contrasting beliefs about the state of climate change, and/or whether it is occurring or not. M2 also noted that terminology which directly addresses climate change should not be used:

...there are lots of things that get talked about when we are studying the river, for instance, or the shrub-steppe ecosystem. There are changes that are happening that are the result of climate [change], but you don't use those certain watch words because it might turn people off...it's so you kind of go around that and present the evidence and present the science without trying to be controversial.

Finally, M3 also described avoiding "trigger" words such as climate change and global warming, the latter being the more triggering of the two, and the effect of using these terms with

community members that hold a contrasting perspective: “So learn about those trigger words, because you can’t approach somebody and say let's talk a little about climate change and the global crisis that's happening. They're already going to stop and stay away from me.”

### Partnerships and collaboration

Each participant described or implied the significance of partnerships and collaboration. Two sub-themes that often arose under this topic surrounded how partnerships may mitigate funding barriers for activities, and partnerships with local schools.

The climate change content at M1’s institution was jointly founded by a prior director at their institution and the former director of a local environmental organization. This partnership brought further collaborations between scientists and artists to bring climate change science and artistic visuals to the community. All in all, this partner is highly regarded in helping to upkeep the institution’s work in this vein. M1 also commented on other outcomes of collaboration:

...I think the collaboration piece is huge. I think that getting to connect with a local group of scientists that are focused on climate change just lends us a totally different lens and also community to really tap into. I mean, our [climate change] events were very well attended, and I think that's because we were tapping into so many different communities...so I feel like that's something that I would highly recommend if other museums can connect with a wider community.

M2 highlighted that partnerships and collaboration are a significant factor in their work. M2 was founded by several organizational entities that partnered in order to create the institution. One of M2’s partnerships was instrumental in the institution’s initial exhibit design and early educational programming. There are many similar environmental organizations in the local area and M2 described that they have all had to learn to support each other and share resources. They have such similar goals that funders must determine whom to give their

resources, and in this way, they partner for sustainability of their vision and goals. M2 also made a suggestion on partnerships with local scientists in relation to sustainability:

...if you're a museum that focuses a lot on science, reach out to the scientists in the community and ask them for their help; they may not have had an opportunity to present their work to the public, yet. So if you can be that place, that's a great thing. Support like that can just help make you more sustainable.

M3 described that partnerships with like-minded companies or organizations are instrumental to locating and supplying funds for their activities:

...when we go for funding, we're really trying to connect with community partners that are well established around here, that have the same mission of environmental stewardship, and inspiring the next generation. When we partner up, grants are more likely to work with you because they're small, little community partners that have a broader reach. So, partnerships are a huge thing for us. [It] also helps us from not reinventing the wheel every time we want to do a public program. So, we're sharing resources...because sometimes you can't get funding, but you have a partner who has the material that you need. So, you're borrowing, switching, and bartering for things we need. So that's one way that we share resources, rather than trying to get actual funding.

M4 is a current board member at their institution. Before M4 held this position, they started out as a partner with the institution to build some of the interactive elements there as well as provided some of their educational expertise for the institution's content. As will be discussed in a later section in depth, M4 as a member of the board is working on a plan to partner the museum and other community funders for a carbon credit project in the community.

M5 described that having local like-minded partners helped significantly with funding because of a mutual need to pool educational resources. M5 noted, "Well funding is always tricky. Because we are a nonprofit we rely heavily, as I'm sure you are fully aware, on grants and generous donations, sponsorships, those kinds of things. But because we partnered with [a local like-minded organization], there wasn't really a financial barrier." There were no further details supplied on how this financial barrier was overcome through this partnership.

While the institution of M6 is still transitioning to increased science and climate change focused content they also described the importance of partnerships and sponsorships at their institution for both funding and community trust purposes. M6 explained that their environmental film series are largely funded by local sponsors who share an interest in providing this type of content and programming for the community. In addition to this, a trust has been built between the institution and the community which, as M6 described has increased the opportunities for partnerships and opportunities for the museum:

...when they hear that we're doing anything that will touch on the topic, they're all on board. So, it has created opportunities for us in terms of partnerships, but the flip side is sometimes they will then have programming that they contact us to come help them with. So, it just continues to get our name out there.

M2 and M3 noted that they utilize partnerships with local schools. M2's institution has been partnering with the local schools for four years and spoke most to the value of observing the students build their knowledge on the topics and feeling increased comfort with the institution. M3 provided another note about funding and partnerships; they described that partnerships with schools not only help students gain knowledge in the sciences and likewise the schools with supplying that opportunity to their students, but that this partnership also helps with their funding:

So, we're really working with those schools who can't afford to have those science programs, that really need that help in this STEM field, which we're seeing a lot of [at] schools here. So, we're really partnering up with that, and with a lot of our grants, they're really wanting to see that extra support for that low-income community because they're wanting to get them back up. They want the equity, right? So that everybody growing up has the same experiences. So, when they are going to college, vocational schools, trade schools, whatever, that they have the same experiences. They have that same knowledge level.

Strong institutional support structure

Each institution described a strong institutional support structure through either a leader that initiated and/or encouraged content in the vein of climate change or environmental impacts, or a leader that encourages strong teamwork among staff. Additionally, two museums in this study were founded by groupings of environmentally concerned individuals or entities.

M1 described that a former director and former leader of a partner organization initiated the climate change content in their institution. They also noted that there have been some “serious conversations” about the climate change content, the scope of a related upcoming project, and its funding with the new director. It appears that these have gone well, as the upcoming project is moving forward. M4 is a board member of their institution and has experience in habitat rehabilitation. While this institution has had some programming and activities which specifically regard climate change, M4 described that recently they, along with other board members, have a greater interest in focusing the content at their institution on climate change—it has to date largely focused more on the native and natural history of the area. In making this shift, M4 wishes to create a carbon credit project for the community that would be supported by the institution. They described that the intent would be to create a local fund that would support directly sequestering carbon or educational activities with the goal of having a, “...loose, down-home, local way of having people be able to mitigate their footprint.” M5 noted their current director is receptive and supportive of this type of content providing little to no barriers in creating those activities. They also described a mutual trust and credibility that has been built between them, the director, and staff as well as with the community. M6 noted that their director has a strong science background and actively encourages not only science-based

content, but also encourages and is highly supportive of their staff's wellbeing and the institutions duty to follow through on providing the community with science-centered content.

M2 and M3 share a similar story of their institution being formed by environmentally interested individuals. M2's institution was formed by several organizational entities that shared concerns about human impacts on the environment, while M3's institution was created by a group of local individuals who were concerned about climate change and the general impacts on their local environment. These individuals now serve as M3's board and contribute to the success of the institution's programs on this topic. M3 stated:

The board was definitely a hands on board at the beginning, doing everything and they've slowly transitioned into like a fundraising board somebody who's, you know, trying to back us and give us all the things that we need to implement this work as a staff.

#### Varying opportunities

Every participant shared that they had experienced opportunities when prompted in the interview. Sub-themes that arose include partnerships and collaboration as well as community connections and support.

M1 and M3 described opportunities through partnerships and collaboration. A large part of the climate change content at M1's institution is founded in the collaboration between scientists and artists as well as through the partnership of a like-minded, local environmental organization. M1 alluded that without these, the climate change activities at the institution may not have occurred. In addition to these, M1 was happy to note that another both collaborative and community connection opportunity occurred with the local government as a result of their climate change programming:

We did a government and resiliency panel, and that was an opportunity for us to connect with all these local governments including one tribal government, [to learn] about how they're responding to climate change. I know that was huge for our community to get to

come together and hear from their government officials about a topic that they might not have gotten face-time on.

M3 noted the opportunity and value in collaborating with local community members and volunteers who have extensive knowledge. M3 described in particular, an opportunity to collaborate with a volunteer who was a retired professor from a notable university on an educational program for students. In addition to this, M3 remarked on the shared opportunities provided through university graduate students. The institution often invites students to share or practice talks about their research on related topics. In this way, M3 expressed, the institution and their visitors gain the benefit of learning new knowledge from these students, and students have the opportunity to test-run their research.

M2, M4, M5 and M6 all noted that they found opportunities through community connection and support. M2 illustrated that this content brings opportunities for connection and dialogue:

There's always the opportunity for human connection. I feel like no matter where you are, people want to know, they want to relate to their surroundings and so the opportunity just to share excitement, especially with people around wildlife, is always a lot of fun. So, no matter who I'm talking to, everybody's got a story to tell and we can connect over that. So, that's been a great opportunity...The more people I talked to, it just becomes more of a conversation than a teacher and student relationship.

M4 noted that the positivity and receptiveness of the community to the institution's climate change exhibits and generally to discussing climate change has been a great opportunity. M4 described that it has given them the confidence to move forward with including more focused content at the institution as well as with their carbon credit project for the community. M5 similarly described how the success of the climate change content among the community opened more possibilities for more. Now the institution has broadened this content to include the general health of the local waterways, the significance of these waterways to the community, and the

climate impacts occurring right now that are changing the dynamics of these water-systems. M6 detailed simply that they were pleasantly surprised by all the new opportunities that have opened to connect with their community.

**RQ3. What is the perceived impact of climate change-related engagement on small and mid-sized museums' communities in Washington State?**

Three themes characterized the perceived impact of climate change-related engagement: 1) community support; 2) cognitive change; and 3) behavioral change.

As a preface to this section, overall there was little data captured from interview responses regarding impacts of the institution's climate change engagement. While three institutions reported utilizing evaluation of their climate change-related content, there were not comprehensive results that could be drawn from these. M1 had conducted more formal evaluation but results could not be obtained from the assessor. While M2 and M3 provided that evaluation has been done through informal manners such as word of mouth or short questionnaires situated next to the exhibits. Participants M1 and M2 also felt hesitant to assume that changes in their community were a direct result of their institution's programming as there are other like-minded organizations in the community working towards similar goals. Finally, the professionals that participated in this study belong to institutions that are within different communities, with different political leanings and beliefs, different socio-economic statuses, and also are at different levels of climate change engagement—whether this topic has been core to their education standards or whether this content is still in the early stages of planning and implementation. These three situations impacted the quantity and quality of data available in response to this research question.

### Community support

M1, M4, and M5 described positive community support for their climate change content. M2 and M6 also described highly positive community support for their institutions, however, these participants appeared to ascribe this support to general programming at their museums not specific climate change-related content.

M1 noted that their community is looking forward to the next climate change event and exhibit at the museum. Specifically, they want to engage in a civil debate and have conversations with their fellow community members about this significant topic. M4 described the community support as generally very positive. As mentioned previously, this support and positive response has even encouraged M4 as a board member to create a community carbon project with the institution, as well as to focus content at their institution more fully on climate change. M5 observed that community support and response has increased every year for their events and programming related to climate change.

### Cognitive change

There were varying cognitive changes presented by M1 and M5. Additionally, though it was described in more behavioral terms, M3 noted that there were many cognitive changes present among community members as a result of the museum's programming.

In addition to formal evaluations, of which the report could not be obtained, M1 also conducted informal evaluations. Two were described during the interview. In one, sticky notes were provided to visitors; on these they were encouraged to write how they feel and think about the looming climate impacts or the exhibit itself. M1 observed that it created an opportunity for people to have a conversation and likened it to having a conversation around the dinner table. In the second evaluation, students were prompted through a survey to describe how they were

thinking and feeling about a fabric installation (described previously) meant to simulate the impacts of increased flooding in the region. Through this M1 observed that students were willing to have a difficult conversation and that exhibits were thought-provoking:

I know that they were deeply impressed by one of the exhibits. [It] was this fabric installation that was at the height of where flood levels would reach...the kids would actually walk into this installation piece and be in this cube of water which is pretty scary. I mean, because there's a lot of implications about how you would be feeling if you were under all that water. But I also was really amazed at when kids wrote about in the surveys of just their wonder and their openness to that conversation. There were definitely some kids that said, "You know, I'm scared. I would be dead. I would drown." But there were also a lot of kids that were just sort of amazed...

M5 described that community members are now showing a spark of interest in the topic and are excited to share new knowledge they have gained in this regard with museum staff.

#### Behavioral change

At this time only two institutions could describe a behavioral change in their community.

M5 described an increase in community members directly involved with or participating at the museum as volunteers. Additionally, M5 received feedback from a local teacher who included some of the museum's content in her classroom curriculum:

...a teacher came to [the event]. She just came with her kids to have a fun museum day and was so inspired by what we were doing here, she started in her own classroom, a whole like section on the same topics. She was like, "Thank you. I was so inspired and the fact that your goal is to teach children their history so that they cannot repeat it in their future..." really spoke to her.

M3's institution has the most robust climate change engagement of the six participants in this study. They reported several behavioral changes as a result of their programming. These include students initiating conversations about climate change with friends, family, legislature, and even local businesses. Students are becoming stewards of their environment by picking up trash at the beaches and making sure they clean up after themselves when visiting an outdoors location. Students are riding bikes or walking and encouraging friends and family to do the same

to decrease their carbon footprint. Students are utilizing less plastics, though this cannot be quantified. M3 exemplified these changes:

...they're already wanting to change their lifestyle...So I'm talking to 25 kids at a time and then from them, they're talking to two other people in their family which slowly spreads out that word. It's amazing to see these kids because over time they're [making] these little impacts, but it's not small because they're talking to people every day. They're making these impacts in their classroom with their family and friends...these kids are coming up with these crazy unique ideas that can work. They can change.

## **Chapter 5: Conclusions and Implications**

The purpose of this study was to explore the dimensions of community engagement on topics related to climate change in small and mid-sized museums in Washington State through the following research questions 1) in what ways do small and mid-sized museums in Washington State engage their communities on topics related to climate change or environmental impacts, 2) what were the barriers and opportunities presented to these small and mid-sized museums in Washington State as they worked to implement engagement activities for their community on topics related to climate change or environmental impacts, and 3) what is the perceived impact of climate change-related engagement on small and mid-sized museums' communities in Washington State? Following a case study design, data were collected through structured interviews with professionals at six small and mid-sized museums in Washington State and supplemented by document analysis drawn from strategic plans, annual reports, and website and social media content when available. This chapter describes the conclusions from this study, positioned within the results from the literature, and provides implications for researchers interested in climate change engagement strategies at smaller regional museums and by museum professionals in utilizing climate change engagement at their institution.

### **Conclusions**

The results of this study suggest that small and mid-sized museums in Washington utilize a diversity of strategies, local relevance, and partnerships to engage their communities on the topic of climate change.

#### Diversity of Strategies

Museums considered a range of strategies, whether by creating exhibits about local climate change impacts, educational programs with visitor-testing opportunities for changes

occurring in the environment, festivals for celebrating and bringing awareness to a keystone species, and generally whatever best fit the audience and resources available. Through this flexibility and diversity of strategy, they have the ability to impact their community's knowledge and perception (Cameron & Neilson, 2015). Geiger et al. noted that:

Robust engagement with topics such as climate change involves being engaged on multiple dimensions: cognitive engagement (e.g., greater understanding about the topic), affective engagement (e.g., feeling hopeful about the possibility to contribute to solutions), and behavioral engagement (e.g., taking action within one's community). (2017, p. 223)

Museum professionals also considered the language with which they spoke about this topic.

Utilizing science-based terminology and encouraging action and resiliency with positive language may invite interested and positive community individuals. Messaging such as this may aid in transcending the politicization of it (Geiger et al., 2017). M3 shared that whichever way a museum decides to engage in this topic, they should talk about it in ways that are not all "doom and gloom" and to make sure that their visitors walk away feeling like they can make an impact.

### Local Relevance

Place-based narratives and communication were utilized in climate change-related activities. Through this type of engagement, visitors were given paths through which to empathize with their local natural environment, to envision how climate change might impact their individual wellbeing, and at the very least were provided knowledge about the changes in their local natural environment. Climate change impacts vary, depending upon geographic location (UW Climate Impacts Group, UW Department of Environmental and Occupational Health Sciences, Front and Centered, & Urban@UW, 2018). Place-based communication on the topic may inform local action whether that be through mitigating or becoming resilient to the effects of the climate crisis (IPCC, 2018).

Remaining sensitive to the politicization of this topic was a common thread among the museums in this study and addressed through their messaging techniques. As many participants noted, using inclusive language will mitigate the probability of losing a community member's support, while cultivating a greater understanding of this topic. This may include strategies of positive, place-based, and science-based communication. Messaging techniques which focus on the social meanings of climate change may provide avenues through which to engage audiences, whether they are politically aligned with climate change science or not (Geiger et al., 2017).

### Partnerships

Partnerships were found to be valuable in a few capacities and to leverage museums' work on this topic. Barriers such as funding were mitigated through partnerships with like-minded organizations. Surprising opportunities for community engagement were discovered such as the local government panel at M1. Described by participants in this study and exemplified through the forming of the Seattle Youth Climate Action Network by three large Seattle area museums, partnerships serve as mutual aid in which organizations can share resources and audiences, and in this way make greater impacts on their community (Woodland Park Zoo, 2019).

### **Implications**

While there appears to be much information about how large institutions conduct this type of work, there has been far less available about how smaller institutions are engaging on this topic. The results of this study provide a glimpse of how climate change engagement appears at small and mid-sized museums in Washington State. As a result of this study's findings, several potential points of connection have emerged.

The significance of conducting this type of research specifically in Washington State regards the recent integration of the ClimeTime initiative (Ruskey, 2018), as well as the findings in both the literature and this study about utilizing locally relevant climate change messaging. This provides an intriguing opportunity situated between the two hundred-plus smaller museums in the state (American Association of Museums & NRP Direct, 2018, p. 2033). Further, a core element of climate change is its effect on people (Intergovernmental Panel on Climate Change, 2018); climate *action* is a matter of human rights and social justice (Intergovernmental Panel on Climate Change, 2014; Janes & Grattan, 2019). This social justice component of climate change combined with the educational service, authority, social standing, and high degree of public trust in museums, provides that there is a social duty for these institutions to address climate change, especially since there has been insufficient leadership from policymakers and government bodies (Cameron et al., 2013; Janes and Grattan, 2019). In considering these factors it appears that the involvement of smaller museums in this conversation with their local community falls in line with the duties of their service and may help to galvanize wider-spread climate communication and action in the State.

The ClimeTime initiative and the benefits of partnerships and collaboration for smaller museums found in this study provides another potential point of connection. A few participants in this study described partnerships and collaborations with local schools regarding climate change education. Some described their museum's content as providing inspiration for teachers and how they teach on the topic, while others noted that the museum provided a tangible outlet for comprehending the climate change content students learn in their classrooms. Considering this and the ClimeTime initiative of 2018, which was created to include climate science as part of Washington's public-school curriculum, K-12 education partnerships with smaller local

museums may pose as a valuable point of connection in spreading climate change communication in the State.

Another area to note is that findings in the literature relayed that there were several barriers perceived by practitioners including remaining mission aligned, issues around funding activities, and politicization of the topic. The results of this study described how partnerships and collaboration, strong institutional structures, and transcending the politicization of climate change were core characteristics of participants engaging on this topic and that these were also factors in avoiding potential barriers such as funding and the community response. Given that these components and characteristics were achieved or held across the museums in this study may imply that they are not far out of reach for other smaller museums who are interested in engaging with this topic but may be concerned about the logistics.

There remains much that could be better understood about climate change communication in the museum field and generally. However, from the work performed in this study there appears to be a very clear area that may benefit from further research—this is the evaluation of the impacts of climate change engagement at small and mid-sized museums in the State on their local community. While impacts on communities as a result of the institution's activities were described by some participants, the ways in which, and extent to which community members were impacted could not be described in length across participants. The all-to-common issue of funding in the museum field, especially for smaller institutions can challenge the ease of performing lengthy evaluative studies of their activities; evaluative studies are a tool that can provide an institution with a clearer picture of the impacts of their content on their audience, helping them to shape future activities to maximize this. This study found that some participants were able to mitigate their funding challenges through partnerships. For

instance, M1 conducted a few evaluative studies of their climate change activities through their partner organization. Smaller museums may be able to utilize the resources of their partners for this means to better understand and reach their audience. It is important to remember that partnerships can take on many forms; another route for mitigating the funding challenge of evaluation studies, as well as freeing up valuable museum staff time is to partner with a Museum Studies or Museology program and utilize student-conducted evaluation and research. For example, the University of Washington's Masters in Museology program provides a specialization in evaluation and has many evaluation-eager students who might be interested in performing that research. These are just two routes that small and mid-sized museums may take to access this tool of impact-measurement during this crucial time of need for climate change communication and action.

While the engagement practices described in this study may serve as a model for institutions interested in this work, simply this study hopes to provide encouragement to small and mid-sized museum practitioners in Washington, and perhaps in other geographic areas too who wish to engage on this topic. There are ways to transcend the potential barriers to this complex topic and there are surprising opportunities that may appear along the way. The public holds a deep trust in museums, and museums can honor that through their engagement on this profound issue (Janes and Grattan, 2019). In closing, included is M5's advice for colleagues that wish to engage their own communities on this topic:

*...do it. Be brave...listen with a critical ear to the criticism that you're getting. Stay focused on your goal because as an educational institution it is absolutely our responsibility to share the truth, and this is the truth. Hiding from it or sugarcoating it does not serve anyone, so, be brave, stay the course and follow your goal.*

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**Appendix A: Sample Email Request for Participants**

Dear [potential participant],

My name is Danielle Sakowski and I am a graduate student in the University of Washington's Museology Program. I am interested in your institution's engagement efforts and would like very much to interview you about its climate-change or environmental impacts related content. It is wonderful to see that your institution is communicating with your audience about these topics, especially at such a crucial time.

As part of my research for my Master's thesis I am interviewing a few practitioners at a variety of small and mid-sized museums within Washington State to learn about how institutions of these sizes are engaging their community on topics related to climate change and environmental impacts—the interview would take approximately 60-75 minutes of your time (in person or by video chat) and would be recorded for later analysis.

I would be so grateful to have your participation in the project and to hear your insights. Would you have any interest and availability to meet with me? Please let me know if there is any additional information I can provide. Included is my thesis advisor, Meena Selvakumar's email meenas2@uw.edu should you like to reach out to her as well. It would be lovely to chat with you and I hope we can connect.

Kindly,

Danielle Sakowski

**Appendix B: Consent Talking Points for Interviews**

Consent talking points included the following:

- Data collector's name and affiliation;
- Purpose of the study;
- Voluntary nature of participation and that there are no consequences for choosing not to participate;
- Participation involves approximately a 60-75 minute recorded interview; only the researcher will hear the recordings;
- Subject responses will remain confidential; subjects may be quoted, but without any identifying information;
- During recording the researcher and participants will please say their name before they share
- Names and contact information for the researcher and thesis advisor will be provided

**Appendix C: Instrument**Interview Guide:

1. What is your position at [your institution]?
2. How long have you worked there?
3. What size of institution does your museum classify itself as?
4. It appears from your website or social media content that your institution has integrated engagement activities or exhibits pertaining to climate change or environmental impacts. Is this correct?
5. Can you briefly describe the type and themes of activities or exhibits related to climate change or environmental impacts that your institution implemented within the last two or three years?
6. Why did your institution decide to implement activities or exhibits on this topic? Was there a specific person, group, or event that was the catalyst for initiating this work in your institution? If so, who or what?
7. Can you describe any outcomes you hope(d) for as a result of [the activities] from the audience? What are they? For example, this could relate to learning or cognitive outcomes and/or behavioral outcomes.
8. If any, what barriers did you encounter while engaging in this work and if so, how did you overcome them as it relates to...
  - a. the institution's mission?
  - b. funding to carry out the activity?
  - c. communication of the topic?
  - d. community response?
  - e. Are there any other barriers you confronted or are now confronting?
9. What opportunities did you find while engaging in this topic?
10. What did support for this work look like within your institution at the start? How does it appear now?
11. Has your institution completed audience evaluations regarding any of its climate change or environmental impact-related activities or exhibits?

- I. If so, will you describe some of the highlights?
- II. Can a copy of the evaluation report be shared with me?

- 12. Have you observed any impacts on your community's cognition about climate change as a result of your institution's programming? If so, what?
- 13. Have you observed any impact on your community's behavior about climate change as a result of your institution's programming? If so, what?
- 14. Have there been any other changes as a result of these programs?
- 15. What advice might you have for other museums in Washington State who wish to engage their audience on this topic?

Do you have any questions, or is there anything else you would like to add?

**Appendix D: Coding Rubric**

Themes	Evidence-Examples Described from Interview Responses	RQ1	RQ2	RQ3
A. place-based climate change communication	M1 described activities regarding specific climate change related changes in their local area such as increased flooding and effects on local community; M5 described events, exhibits, and programs that examine keystones to the environment and their local industry like salmon and their local waterways that provoke thinking in greater terms about climate change "we teach children this so they can understand not only the community history but the impact they individually have on the whole"; M2 described talking with visitors about a major local waterway and how it is changing as a result of CC as well as trying to instill "...a sense of place and sense of pride in the history of this place and inspiring them to want to be involved in the future [of the place]..."; M3 described specific CC impacts like ocean acidification, sea level rise, pollution of waterways, and erosion in their area and real-time citizen science testing so visitors can see these impacts happening now.	👍		
B. science-based communication	M2 described talking about CC in terms of education and presenting the science of it; M3 affirmed, "We teach facts, not opinion"; M1 partnered with real scientists and other science-based organizations who helped to form the scientific narrative/language; M5 described using scientific facts to describe impacts.	👍		
C. multi-modal	Overall, these museums present opportunities for a variety of interactive experiences whether directly related to the topic or indirectly-M1 described educational programs at both the institution and local schools, as well as exhibits on local CC impacts; M5 has exhibits, events, and educational programs on CC impacts in the area; M3 has educational programs, exhibits, and events on the CC impacts; M4 has had specific exhibits on local CC impacts as well as outdoor educational programs that indirectly discuss the topic.	👍		
D. individual empowerment for action and/or resiliency	M2, M3, M4, and M5 stick out most as those that encourage getting involved in some way in their community or having a relationship with their place, local environment and nature. They all used words such as inspiring a sense of place and encouraging involvement in the future of the place, or showing the ways in which they can get involved or make change. Specifically, M5 described providing positive options for what visitors can do about these issues. M3 also noted that they always present the topic in a positive light, there is something that can be done about it.	👍		
E. politicization of climate change affects how it is communicated	All participants had something to say on this topic, here are a few-M6 described their own personal perspectives on living in an area where the topic is taboo, so this has affected their own personal communication style on it; M2 described the area as being conservative and not talking about CC directly and certainly not using any specific language such as climate change; M3 described similarly that you don't use trigger words like climate change or global warming because you don't want to turn people off.		👍	
F. strong and/or numerous partnerships and collaborations	Again nearly all participants had something positive to say about the doors that opened through collaborations and partnerships-M1 described the successful collaboration between scientists and the institution in creating a very popular exhibit among the community, as well as a local environmental organization and partner being instrumental in creating this type of programming; M6 described how their partners and local sponsors help to sustain their activities generally and specifically regarding CC so the museum can focus on creating a financially accessible space to their local community members.		👍	
G. strong institutional supports	Each institution had either a leader that initiated and/or encouraged content in the vein of climate change or environmental impacts, or a leader that encouraged strong teamwork among staff. Two museums in this study were founded by groupings of environmentally concerned individuals or entities.		👍	
H. varying opportunities	M2 described the opportunity for human connection; M5 described the opportunity for expansion of programming to other climate change related concerns in their local area; M1 described opportunities to host forums between local government officials and the community.		👍	
I. community support	Overwhelmingly, participant institutions describe positive community support generally of the museum, and several describe specific community support of their CC related activities such as M1 noting the huge popularity of their flood exhibit; M5 described how on board the community is with their CC content and the huge popularity of a specific event around salmon as a keystone species			👍
J. perceived behavioral change	M3 described the most behavioral change noting that children visitors have begun going to local legislature, businesses, and family/friends to talk about the issue, or provoke physical behavioral change such as speaking with a local golfing facility about the impacts of their fertilizer washing into the waterway; M1 described how excited people are to have the conversation about CC at their museum. Others believed it was too early to tell, or described in terms of increases of museum-involved community members, though this may relate more to the community support theme			👍
K. perceived cognitive change	Again, some participants related this to the positive community support of the museum indicated through verbal enthusiasm about the museum's work regarding this topic; M1 and M6 described cognitive change in these terms; M4 described "the physical impacts are being seen and felt [provided example of nearly unbearable summers with smoke from wildfires]" and believes that people are gaining some understanding about why some of these changes are happening (the fires and mudslides) from content at the institution.			👍

**Key:**

RQ1: In what ways do small and mid-sized museums in Washington state engage their communities on topic related to climate change or environmental impacts?
RQ2: What were the barriers and opportunities presented to these small and mid-sized museums in Washington state as they worked to implement engagement activities for their community on topics related to climate change or environmental impacts?
RQ3: What is the perceived impact of climate change-related engagement on small and mid-sized museums' communities in Washington state?