UNDERSTANDING PERCEPTIONS OF NATURE-BASED TOURISM
STAKEHOLDERS’ ADAPTIVE CAPACITY TO CLIMATE CHANGE IN MAINE

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Abstract
The purpose of this research is to gain an in-depth understanding of the diverse perceptions of nature-based tourism stakeholders’ on impacts, mitigation and adaptive efforts to climate change in Maine. The nature-based tourism industry in the state is highly seasonal, making the industry especially sensitive to weather and climatic variations. Climate change scenarios for Maine currently suggest increases in average annual temperature and precipitation and a reduction in annual snowfall. This paper describes some preliminary results from an ongoing comparative case study seeking to understand stakeholders’ perceptions of climate change and tourism at two major tourism regions in Maine. Data is being collected using semi-structured interviews with a diversity of tourism stakeholder organizations within each of the regions to better understand their perceptions of destination resilience, efforts toward reducing emissions, and their adaptive capacity to confront climate change.

1.0 Introduction
As the effects of global climate change continue to impact social and ecological systems throughout the Northeastern United States, it is becoming increasingly relevant to examine these effects on outdoor recreation and nature-based tourism in the region. The State of Maine has a highly developed tourism industry that is deeply rooted in outdoor recreation (NESFM, 2013) and therefore is progressively becoming more susceptible to the effects of climate change. Tourism in Maine supported 88,585 jobs and generated approximately $5.2 billion in travel-related expenditures in 2013, making it one of the state’s largest industries (Maine Office of Tourism, 2014). Given that tourism and outdoor recreation contribute so much economically to the state, it is important to develop an understanding of how the suppliers/managers of these tourism-related resources perceive the effects of climate change on their industry. Maine’s future climate is expected to have varying effects on its tourism industry for all seasons of the year (Daniel, Bell, Daigle, Gabe, & Leahy, 2009). The primary climate-related concerns pertinent to tourism are milder winters and wetter summers (Daniel et al, 2009). It is expected that global sea levels will increase 1-4 feet by the year 2100 and that the coastline along the Northeast U.S. may
exceed this global average (Horton, Yohe, Easterling, Kates, Ruth, Sussman, & Richmind, 2014). This makes nature-based tourism and outdoor recreation opportunities along the coast of Maine especially vulnerable to climate change.

Winter recreation activities that are popular in Maine, such as snowmobiling, have also been shown to be extremely vulnerable to climate change (Scott et al, 2008). Under various modeled climate scenarios for snowmobiling in the Northeast U.S., only Northern New Hampshire and Northwest Maine will be able to maintain long (>70 days/year) snowmobile seasons if the effects of climate change are relatively mild (Scott et al, 2008). If the effects of climate change are relatively severe, there will be no place in Maine after 2070-2099 with adequate conditions for a long snowmobile season (Scott, 2008). Future changes in the climate also are predicted to affect various landscapes and wildlife species that are essential to the quality of Maine’s tourism opportunities. Mountain top forests and coastal areas are known to be especially vulnerable to changes in the climate (Whitman et al, 2013) and are both highly favored by Maine visitors based on SCORP (Maine Maine Department of Conservation- Bureau of Parks and Lands, 2009). Key species that attract tourists, such as the Common loon (Gavia immer), Atlantic puffin (Fratercula arctica), and Eastern moose (Alces alces americana) each are rated as having a high vulnerability to the impacts of climate change (Whitman et al, 2013).

In the context of this research, adaptive capacity is defined as the ability of a system to prepare for stresses and changes in advance of, or to adjust and respond to the effects caused by the stresses (Smit, 2001). Adaptive capacity is a concept that is well-suited for application when assessing the natural and social effects of a stress such as global climate change. “Increasing adaptive capacity improves the opportunity of systems to manage varying ranges and magnitudes of climate impacts, while allowing for flexibility to rework approaches” (Engle, 2011). It is important while assessing adaptive capacity to develop indicators that can serve to measure adaptability (Adger & Vincent, 2005).

The purpose of this study is to develop a greater understanding of how nature-based tourism stakeholders in Maine perceive the effects of climate change to the industry, and the strategies developed to adapt to those perceived changes. A comparative case study strategy is being implemented in two major tourism regions in the state that correspond to two different climate regions. We intend to understand differences and similarities across regions.

2.0 Methods

A comparative case study design method (Creswell, 2013) is being utilized to better understand perceptions of the potential implications that climate change poses for nature-based tourism as defined by tourism stakeholder organizations in two regions of Maine. To develop this understanding, formal in-person semi-structured interviews are being conducted with recruited participants representing a variety of private, NGO, and government organizations/businesses. Interviews are recorded and later transcribed verbatim (Gibbs, 2007). Study participants are selected using two purposive selection strategies. Criterion selection (Emmel, 2013) is used to identify and include stakeholders representing government agencies, non-governmental organizations, and private businesses that provide of nature-based tourism opportunities in each
of the study regions. Snowball selection strategy (Patton, 2002) or chain referral (Emmel, 2013) is used where participants suggest other peers in their regional tourism industry that should also be interviewed for the study. Interviews will continue until saturation or redundancy of responses is achieved (Merriam, 2009). The study protocol was approved by the University of Maine Internal Review Board; procedures to protect privacy of participants and confidentiality of data are followed.

The interview discussion topics cover items such as background of the participants’ organization/business, their opinions regarding the current and future conditions of tourism in their region, their perceptions regarding climate change and its relation to tourism in their region, actions they have taken to adapt to the current or future effects of climate change, and their ideas about what other tourism-related entities in their region have been doing to adapt to climate change. Data analysis from interview transcriptions is being conducted with thematic coding (Miles, Huberman, & Saldana, 2014) using NVivo 10 (QSR International, Australia) qualitative data analysis software (Bazeley & Jackson, 2013).

2.1 Case study regions
Criterion selection (Emmel, 2013) was used when selecting the two regions of Maine for this comparative case study. The two regions had to: 1) have an established or emerging nature-based tourism industry, 2) be associated with a highly visited state or federally owned park in the state, 3) represent different climate regions in the state, and 4) include coastal and inland/mountain tourism destinations. Mount Desert Island and the region surrounding Katahdin, Maine’s highest mountain, were chosen.

The Mount Desert Island Region is located in Eastern Maine, Hancock County, along the coastline. It is the biggest island in state, with an area of approximately 108 square miles. The largest and more visited community in the area is Bar Harbor, ME. The region receives approximately 2.5-3 million visitors annually and includes Acadia National Park as its most prominent attraction. Acadia National Park ranks 32/369 most visited U.S. National Park Units (NPS, 2013). The region also has a well-established nature-based tourism industry that is essential to local prosperity.

The Katahdin Region is located in the Northern-Central portion of inland Maine, Piscataquis County. The major community here is Millinocket, ME. Estimates indicate that the region receives approximately 150,000-165,000 annual visitors and includes Baxter State Park as its most prominent attraction. Mount Katahdin, as the highest mountain in Maine and representing the northern limit of the Appalachian Trail, attracts national and international visitors. The region boasts a strong and emerging nature-based tourism industry while currently suffering from a declining local forest products industry.

3.0 Preliminary results
Since this research is currently being conducted, only preliminary results for this study are being presented in this article. As of this writing, nine interviews in total have been conducted with stakeholders in the Mount Desert Island and Katahdin Regions. In Mount Desert Island, three interviews have been conducted, and six interviews have been conducted in the Katahdin
Region. Only one stakeholder organization has declined to participate so far. Due to the limited number of interviews conducted so far, general trends/concerns expressed by stakeholder organizations from both of the case-study regions have been combined for the purpose of this article. From the initial analysis of these nine interviews, the following four key initial themes have emerged:

1) **Participants generally agree that climate change is occurring and is the direct result of human activities.** A frequent concern among participants is that the climate is indeed changing and its cause is linked to the burning of fossil fuels and global greenhouse gas emissions. There was also concern with the limited knowledge we have on its implications. Generally they believe that changes in the climate is already having or will have a noticeable influence on summer and winter weather in their respective regions.

   “I think that it (climate change) is happening, I think that it is human caused, and we are trying to prepare for it” (government employee, Bar Harbor, 3/11/2014)

   “…I think that it is a profound issue that I don’t think we have even fully yet comprehended” (NGO employee Millinocket, 3/21/2014)

Two of the nine participants, however, did not believe that climate change was actually occurring and were skeptical of its presumed effects.

   “…I think that it is narcissistic to think that humans can have that much of an impact on the earth…and that is what makes me skeptical.” (Private company employee, Bar Harbor, 11/1/2013)

2) **Participants generally agree that climate change will affect tourism in their area.** While the participants who are skeptical about the effects of climate change do not think it would affect tourism, those who agree that climate change is occurring also agreed that it would affect tourism in their region. Tourism and outdoor recreation activities, tourism structure and supportive infrastructure, as well as changes in the numbers of visitors were among the changes mentioned.

   “A lot of the outdoor culture and things here are tied to the way that landscape is. If it becomes different, all of the other infrastructure and cultural associations have to change.” (Government employee, Millinocket, 2/26/2014)

Some participants did not what to express an opinion on the impacts to the industry, as they believed they did not have enough data or information to take a stance on the issue. Participants in some instances believed that climate change will have profound effects on nature and society, but are unclear about how these effects would specifically relate to tourism.

   “I still don’t know how to eek climate change issues out of my everyday experiences (as a bird-watching guide). I don’t know and don’t have enough data to make any good statements locally.” (Private company employee, Bar Harbor, 1/15/2014)
Other participants, however, are able to cite very specific effects that they believe tourism and their particular organization/business has been or could be affected.

“...In some respects climate change is lengthening the season in Millinocket because it is providing for, not so much for the early and in May, but in later October there are more people that are willing to stay later.” (Private company employee, Millinocket, 1/20/2014)

3) Participants have a wide range of concerns regarding the effects and impacts of climate change on tourism. In addition to concerns that climate change would have effects on weather systems and changes in visitation, participants also expressed that climate change would have an influence on a broad variety of tourism resources and recreational opportunities. Participants are noting that climate change will affect or has already affected whitewater rafting, big game hunting species, fisheries health, snowmobiling opportunities, bird habitat, changes in forest composition, and land management issues associated with more volatile storms and increased rainfall.

“Climate change has impacted our rafting and river related activities. Two years ago we lost all of our snow in the first week of March and all of the runoff that would be coming into the rivers was gone very early.” (Private company employee, Millinocket, 11/14/2014)

“over the last two weekends we have called people who have made reservations to go snowmobiling and we told them not to drive all the way up from Connecticut to go snowmobiling and have a bad experience” (Private company employee, Millinocket, 1/20/2014)

“I am noticing that moose are encountering (more) winter ticks. Whether or not that is directly related to our climate I don’t know.” (Private company employee, Millinocket, 3/19/2014)

Several participants, however, do believe that climate change could, at least in the short term, have a positive effect at the end of the fall tourism season. Some believe that the last two weeks of October could become a more popular part of the year for visitors because of increased warming at the end of the visitor season and could potentially offset decreased visitation at the beginning of the summer.

4) Participants’ adaptive capacity to climate change and environmental responsibility varies greatly. In general, participants have reported that they have taken little to no action toward adapting to the effects of climate change. Most participants represented organizations/businesses that are relatively small-scale operations and do not have a significant carbon footprint, but expressed interest in reducing their emissions whenever practicable. Some participants have reported that they are exploring potential options to reduce their fuel consumption by installing solar panels or heating their facilities with wood fuel. These adaptations typically have been cited as cost-saving adjustments, but also are part of efforts to reduce emissions.
Some participants already have decided to make substantial adaptations to their businesses in the face of the effects of climate change. Changes such as diversification of activities, expanding operation to other seasons of the year, changing marketing and strategic plans are among some of the adaptations in place. One particular business owner has made an effort to place a lower emphasis on the opportunities they provide for snowmobiling and focus more of their marketing on other activities, such as cross-country skiing and snowshoeing, which require less snow. Two other entities have made climate change adaptations an aspect of their management strategy. One participant noted that since they know that climate change will affect their ability to provide opportunities in the future, they have already developed a marketing approach that focuses more on winter activities that do not require as much snow. Another participant noted that since they have seen more favorable climatic conditions during the latter part of the autumn visitor season, they have decided to test to see if the demand is great enough to extend their opportunities for fall camping into later in the season. They cite that climate change is expected to have an impact on Maine’s forested landscape and that could have an effect on tourism and recreation.

“....as far as winter goes, we have started to develop and we are trying to wean ourselves off of a total dependence on snowmobiling. We are now emphasizing cross country skiing and snowshoeing, which can be done in smaller spaces in our area that don’t require as much snow” (Private company employee, Millinocket, 11/14/2013)

“We have put out a proposal to extend this fall’s camping season. For forever, the season has always ended on October 15, so this year we are saying were going to go for another 10 days here and another two weeks there. We’re going to see what the demand is on the part of our visiting public.” (Government employee, Millinocket, 2/26/2014)

4.0 Discussion and future direction
It appears that from the interviews completed so far, participants are reporting they have made relatively few, but significant, adaptations to respond to the effects of climate change. This is a somewhat interesting finding given that nearly all participants interviewed so far agree that climate is occurring and will affect tourism in their area. Few participants reported that climate change had already affected their business/organization, so adaptive efforts may, for the most part, be implemented after or when the effects of climate change become more pronounced. It appears that while some respondents have reported minimal or no adaptive efforts, some respondents have taken the issue very seriously and have taken actions toward adapting to climate change. This is especially true for the Katahdin region.
Few participants mentioned strategies in place to reduce their carbon footprint, or their contribution to the climate change problem. The biggest obstacle identified is the limited capacity of these small-businesses to be able to afford the required changes.

It will be necessary to continue interviewing more stakeholders to gain an in-depth understanding of perceived impacts and the adaptive capacity/efforts toward climate change on Mount Desert Island and the Katahdin Region. Currently, enough data has not been generated to
make relevant comparisons between the two regions, and be able to accurately identify similarities and differences.

Future research will be designated to complement this effort, include a visitor survey implemented to assess their perceptions of the influence of climate change on tourism and understand potential changes in visitor behavior due to climate change in the two case study regions.

5.0 References


