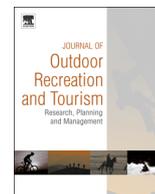




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Nature-based tourism and climate change risk: Visitors' perceptions in mount desert island, Maine



Sandra M. De Urioste-Stone^{a,1,*}, Lena Le^{b,2}, Matt D. Scaccia^{c,1}, Emily Wilkins^{d,1}

^a 5755 Nutting Hall, #237, Orono, ME 04469-5755, USA

^b Short Hall #133, Pullman, WA 99164-4014, USA

^c 5755 Nutting Hall, #223, Orono, ME 04469-5755, USA

^d 5755 Nutting Hall, #231, Orono, ME 04469-5755, USA

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ABSTRACT

Climate change poses many risks for nature-based recreation and tourism, especially in protected areas and parks. This paper discusses visitor risk perceptions of climate change and its impacts, and their potential consequences for nature-based tourism destinations such as national parks. An online survey was used to assess visitor risk perception on the likelihood of climate change impacts to affect Mount Desert Island (MDI)-Acadia National Park in the next 10 years, and potential risks those impacts could pose to visitors. Environmental impacts such as extreme weather and sea level rise were perceived by respondents as the most likely effects of climate change to MDI in the next 10 years. Conversely, respondents' risk perceptions of climate change impacts as threats to visitors showed an increased importance of other environmental impacts such as increased presence of mosquitoes and ticks; with extreme events as the key risk to visitors. However, perceptions that pose potential personal risk to visitors gained in significance when considering their influence on travel behavior, including impacts such as disease outbreak and water scarcity. Factor analyses with varimax rotation identified four climate change impact factors associated with perceived vulnerability, perceptions of risk, and influence on future travel to MDI; the four factors generated were: weather patterns, impacts on wildlife, access and health, and physiological and safety needs. Results from cluster analysis yielded three segments: Skeptics, Believers, and Cautious. Segments were significantly different in how they perceived the vulnerability of the area to the effects of climate change, perceived risks, and changes that may influence travel behavior.

MANAGEMENT IMPLICATIONS

The present study has important implications for nature-based tourism management, particularly as associated to protected areas, such as national parks. Consequently, protected area managers may discuss whether the effects of climate change and visitor perceptions could be included in the overall management and monitoring efforts. Climate change most likely will influence travel behavior to national parks and other protected area categories, impact how visitors perceive potential personal risks and threats associated with their travel, and will impact the natural environment and infrastructure tourism relies on. Furthermore, diverse perceptions hold by travel segments, different visitor perceptions based on demographics (age, gender, and income), and seasonal influence in travel should be considered in the management of tourism activities within protected areas.

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1. Introduction

Climate change poses a significant threat to tourism across the globe (WTO, 2008), particularly through increasingly variable weather patterns (Karl, Melillo, & Peterson, 2009). As the effects of global climate change begin to show significant effects on tourism systems, it has become increasingly relevant to examine these

* Corresponding author. Tel.: +(207)581 2885.

E-mail address: sandra.de@maine.edu (S.M. De Urioste-Stone).

¹ School of Forest Resources and Center for Research on Sustainable Forests, University of Maine.

² Social and Economic Sciences Research Center, Washington State University.

changes in terms of the perceived risks experienced by visitors to affected destinations (Huebner, 2012)—especially nature-based tourism systems connected with U.S. National Parks (Brownlee, Hallo, Wright, Moore, & Powell, 2013).

It has been argued that climate change represents a major threat to the integrity of the global protected area system (Sharp, Lemieux, Thompson, & Dawson, 2014), particularly coastal and marine protected areas. The U.S. Department of the Interior has recognized that certain resources the national parks have under their authority have been subject to the effects of climate change and will continue to be negatively impacted (National Park Service, 2012) such as rising sea-levels, increased habitat fragmentation, etc. (Parmesan & Yohe, 2003). Changes resulting from climate change are already affecting nature-based tourism assets in parks and protected areas worldwide (Brownlee et al., 2013; Jones & Scott, 2006; Sharp et al., 2014). Moreover, it has been argued that climate change will affect the timing of visitation as well as use patterns throughout the coming years (National Park Service, 2012). Research that seeks to understand how climate change will influence the nature-based tourism systems associated with national parks and how they are at risk is increasingly needed.

Future visitation modeling for national parks in Canada has found that climate change will affect nature-based tourism there (Scott, Jones, & Konopek, 2007). It has been found that from 1979–2008, the timing of visitation to national parks has been shifting and that ‘peak attendance’ days are expected to occur earlier in some parks due to warmer weather arriving earlier (Buckley & Foushee, 2012). Changes to national parks induced by climate change pose significant risks to both nature-based tourism systems as well as visitors. Research specifically describing the effects of climate change on nature-based tourism in U.S. National Parks has been relatively limited (Brownlee et al., 2013; Sharp, Brownlee, & Larson, 2012). Even fewer studies, however, have addressed the perceptions of consumers on vulnerability, risks, and travel behavior associated with nature-based tourism in national parks (Sharp et al., 2012).

Current literature describes that social science research on visitors perceptions of climate change could be a critical tool in effectively guiding decision-making associated with climate change and tourism in protected areas, such as national parks (Brownlee & Leong, 2011). As suggested by Huebner (2012), research on tourism and climate change may be enhanced by a greater understanding of visitors’ perceptions of vulnerability, nature-based tourism risk perceptions associated with climate change, and how these perceptions of vulnerability and risk may impact behavior.

1.1. Climate change and vulnerability assessment

The United Nations World Tourism Organization (WTO) has noted that visitors’ perceptions of climate change effects to the natural and cultural environments are just as important as the actual occurrence of changes (WTO, 2008). These perceptions are likely to impact travel behavior such as destination selection, activity participation, and timing of travel. According to the Intergovernmental Panel on Climate Change (IPCC), vulnerability is defined as “The propensity or predisposition to be adversely affected [and] encompasses a variety of concepts and elements including sensitivity to susceptibility to harm and lack of ability to cope and adapt” (McCarthy, Canziani, Leary, Dokken, & White, 2001, 5.). Few studies have explored visitors’ perceptions of vulnerability (Huebner, 2012) of a destination to climate change. Huebner (2012) proposed a model to measure consumer perceptions of vulnerability based on ideas from health studies, whereby perceived vulnerability was to be measured in terms of the perceived likelihood of a threat to occur or develop. For this study, the

authors assessed visitors’ vulnerability perceptions of climate change effects as “an individual’s belief about the likelihood of the occurrence of climate change impacts or the likelihood of their developing” (942) to the Mount Desert Island tourism destination—Acadia National Park, Maine.

1.2. Climate change and risk perception

Riesch (2013) defines risk as “the amount of uncertainty combined with the potential severity of an outcome” (31). In the context of climate change, the IPCC has defined risk as the “potential for consequences where something of value is at stake and where the outcome is uncertain...resulting from the interaction of vulnerability, exposure, and hazard” (McCarthy et al., 2001).

With growing concerns about global climate change and its effects on socio-ecological systems, an increasing number of studies have focused on understanding public climate change risk perceptions that could potentially influence policy development and adaptation efforts (Etkin & Ho, 2007; Leiserowitz, 2006; Smith & Leiserowitz, 2012). The study of risk perceptions of climate change has been challenging, as these perceptions have shown to be complex and multidimensional (van der Linden, 2015). Moreover, studying climate change risk perceptions has been particularly challenging due to the uncertainties of the topic as precise future environmental changes and conditions are unknown.

Very few studies have explored people’s perceptions on climate change vulnerability in conjunction with risk perceptions (Safi, Smith, & Liu, 2012). Furthermore, it has been proposed that more research is needed to investigate the potential relationships between vulnerability perceptions, risk perception, and behavior (Weber, 2011). Following Huebner’s (2012) research on climate change and tourism to small islands states, the present study assessed visitors’ risk perceptions, defined as an individual’s belief that a potential climate change impact may represent a threat to visitors/recreationists to MDI Acadia National Park.

1.3. Climate change and tourism: Vulnerability, risk perceptions, and travel behavior

Since tourism is highly dependent on climatic and natural resources (Gössling & Hall, 2006), the industry as a whole is especially vulnerable to climate change related hazards and exposure. The effects of climate change to tourism and travel has been particularly challenging as people’s responses to potential conditions and scenarios are largely unknown (Gössling & Hall, 2006), and potentially mediated by perceptions of vulnerability and risk (Huebner, 2012).

A wide variety of natural and cultural climate change impacts are expected to have consequences to tourism destinations. Coastal and island destinations have been predicted to be especially vulnerable to climate change due to pressure from increased storms, extreme climatic events, coastal erosion, flooding, and even water shortages (WTO, 2008). Climate change is expected to have many negative impacts on wildlife, including shifts in species distribution, changes in phenology, species demographics, and even possible extinction or extirpation of certain species (Mawdsley, O’malley, & Ojima, 2009), which could have an effect on wildlife-related recreation and tourism activities.

These impacts of climate change may be perceived as potential risks to the visitors and their travel experience. It is believed that climate change will result in a higher frequency of extreme weather events; therefore, future tourism demand may be negatively affected since visitors may need to plan shorter holidays, or travel at different times of the year as a means of reducing associated travel risks (Bigano, Goria, Hamilton, & Tol, 2005). For example, climate change poses a risk to transportation infrastructure

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