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Effects of Climate Change on Tourism in the Mid-Atlantic

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Executive Summary

The effects of climate change are being felt worldwide and tourism and recreation providers are often among the first to feel the physical and economic effects. Climate change has direct impacts to environmental patterns on a global scale, which affects physical conditions of tourism sites and attractions. This study was conducted to investigate the effects of climate change on a small sample of tourism and recreation providers in the mid-Atlantic. Results indicate that climate change is a very important issue in the field, having lasting effects, changing visitor use patterns, and leading to physical impacts to tourism sites such as flooding, wildfires, and severe storms.

Recreation and tourism providers could use adaptation techniques to deal with climate change. Three techniques suggested in this paper include utilizing shoulder season visitation, diversification of offerings, and recovery-specific travel opportunities. Although there are no easy answers to the challenges posed for tourism by climate change, there seems to be hope for those professionals that embrace the opportunities to adapt.

Introduction

Climate change is having significant impacts on many facets of everyday life, and the commercial recreation and tourism fields are often at the forefront of these impacts as consumers are faced with making difficult decisions with discretionary income (Ana Irina, Camelia, Marius, Cristi, 2014). Understanding how these impacts are changing the way people engage in recreation and tourism activities is essential to maintaining successful businesses and providing satisfying opportunities for consumers. Climate change is defined as a change in environmental

patterns on a regional or global scale and it is a direct result from the excess of carbon dioxide in the atmosphere which is attributed to the burning of fossil fuels (Wong, 2016).

Over the course of the last century climate change has become an increasingly important conversation among scientist and world leaders. In tourism, researchers have investigated multiple facets of the issue such as tourism flows and seasonality (Amelung, Nicholls, & Viner, 2007), effects on international tourism (e.g., Scott, Gossling, & Hall, 2012; Hamilton, Maddison, & Tol, 2005; Agnew & Viner, 2001), tourism adaptations (Scott, Hall, & Stefan, 2012), and the economic impacts of climate change on tourism (Pham, Simmons, Spurr, 2010).

Climate change can be linked to the economic strain that densely populated tourism destinations are facing at the expense of unanticipated and often detrimental weather strikes (Reddy & Wilkes, 2012). It is impossible to ignore the correlation between the change in climate and the increasing unpredictable weather patterns. When a natural disaster hits an area, it not only impacts the community, but the entire region. An example of this phenomenon were the wildfires that Gatlinburg, Tennessee experienced in 2016. Although ignited by visitors to Great Smoky Mountains National Park, they were said to have gotten out of control due excessive drought conditions and high winds (Fritz, 2016). The fires were credited with destroying physical landmarks around the Smoky Mountain Range and drove tourism out of the area. The decrease in tourism immensely impacted communities such as Gatlinburg, Pigeon Forge and Sevierville, that rely heavily on the tourism industry to stay economically stable.

Additionally, regions such as the eastern seaboard are having increasing issues with sand dune erosion continually increasing after each hurricane season. Hurricane seasons are becoming progressively worse and the destruction to smaller beach towns such as Ocracoke Island or Hatteras Island take the brunt of the economic hit when consumers are not returning due to the visible destruction (Paris & Mitasova, 2018). Climate Change has also affected more sought-after tourist destinations such as Kiawah Island, SC, who will be hosting the PGA Tour in 2021 (Jeff, 2015). A major draw to the Island is the Ocean Course, which is one of the five main golf courses offered to consumers while staying at the resort. The Ocean Course has been experiencing environmental impacts due to the ocean's progression to the mainland, which has affected the overall play of the course and the attraction to the destination (Jeff, 2015). In the Southeast a theme of the transience has emerged due to the notable impacts of climate change (Van Noy, 2019).

Colder climates are also facing a drawback in prime recreational activities that attract consumers to their areas during the winter months due to a decrease in the quality of conditions. The lack of snow due to the rise in air temperature throughout the winter leads to poor slope conditions. This creates a massive economic setback during the off-season for winter tourism destinations because they are not producing enough revenue in season to sustain their business during the less popular months (Beaudin & Huang, 2014). It is essential for tourism and urban planners to understand the impact that climate change is having economically on the tourism industry, specifically regarding the consumers' destination choice. The economic setbacks to communities impacted by natural disasters that occur due to climate change are detrimental to the future

prosperity of the community as a whole - which often take years, if not decades, to recover from (Reddy & Wilkes, 2012).

Two main ways to deal with the effects of climate change are *mitigation* and *adaptation*.

Mitigation focusses on mitigating the factors that are leading to climate change in the first place, namely the burning of fossil fuels. It focusses on identifying the most effective avenues for reducing our carbon footprint, and building techniques or priorities around them. Mitigation is a tough road to follow, especially in a deeply engrained fossil fuel-dependent society and economy, with powerful stakeholders not ready to give up their hold on the economic advantage. The 2015 Paris Agreement has global intentions, but humans as a whole are not stopping the increase in carbon emissions. In short, the mitigation aspect is not going well (Van Noy, 2019).

Adaptation focusses on adapting to the inevitable impacts and changes that will come, as a result of climate change. It means “making changes to activities, rules, and institutions to minimize risk and damage” (Van Noy, 2019). This means tactics such as building bigger seawalls, increasing water elimination systems in low-lying cities to deal with floods, erosion control, wildfire preparedness, emergency response strengthening, and disaster training. It means changing behaviors, either voluntarily or with rules and regulations, to lead to alternate outcomes that better adapt to a climate changed world. This seems to be the route most often utilized since there has not yet been a unanimous agreement to move on from fossil fuels, and each municipality, organization, group, or individual, is acting on their own behalf.

Tourism providers are often one of the first to feel the effects of climate change as they witness the impacts first-hand. Travel and tourism is dependent upon discretionary income, free time, visitor interest, available resources and facilities in the host site, and a host of other factors that come together to create an “experience” for the visitor. If a site falls out of favor, due to changes or impacts due to climate change, these providers are the first to recognize it. Because of this, these professionals can provide valuable information to understanding how climate change is affecting their business; having significant impacts; affecting economic outcomes; changing visitor behaviors; and what future trends in the discipline can be expected as a result of climate change. This study explored these aspects of the impacts of climate change on tourism, and provides a descriptive account of the results garnered from a very limited number of respondents across the region.

Methods

During the summer of 2018, unstructured interviews were conducted with 16 tourism providers in Southwestern Virginia, the Great Smoky Mountain region of Tennessee, Asheville, North Carolina, and the coastal Charleston, SC region, based on a convenience sample. These interviews were aimed at gathering professional observations and general information about how climate change was affecting tourism in their business or organization. From this, a survey was developed and sent back as a follow up to each of these 16 tourism providers. The survey gathered specific information about how climate change was affecting these businesses, impacting the businesses economically, changing visitor behaviors, and what future trends in the discipline could be expected as a result of climate change.

Surveys were distributed to the 16 tourism professionals via an online survey sent to email addresses gathered during the interview discussions. Two follow-up email reminders were sent after the initial invite to participate in the survey. After the third email, no other reminders were sent and the surveys remained open for respondents to participate if they chose to do so. Data was then exported to SPSS for analysis.

The survey consisted of 15 questions, several of which asked respondents a series of rank order questions on a scale where 1 = not at all, and 5 = extremely. Questions consisted of the extent to which they believe climate change is an issue, and how often they are experiencing the effects of climate change (i.e., severe storms, flooding, less predictable weather patterns, drought/dry spells). Questions also asked respondents to indicate how climate change is affecting their business or organization either positively or negatively, what the most significant impacts of climate change are in their area, and to estimate the amount of tourism dollars lost or gained from climate change. Finally, questions asked respondents what they believe the future impacts climate change may have on their business or organization, and if visitor use patterns have been altered due to the effects of climate change.

Results

Of the 16 organizations surveyed, 10 responded, and eight of which were complete, usable surveys for a response rate of 50%. Respondents were equally divided between the four states with 2 from each of North Carolina, South Carolina, Tennessee, and Virginia. Of the two North Carolina tourism providers, one was a business that focusses on providing tours and entertainment for visitors to Asheville, while the other functions as a lodging and getaway

provider for visitors to the region. In South Carolina one respondent was from a tourism office, while the other was from a well-established coastal resort. The Tennessee respondents consisted of a highly visited park, and a tourism office. Finally, the Virginia respondents were a tourism office and a convention center that also functions as a marketplace for local artisans.

Overall, climate change was seen as a “significant” or “extreme” issue with a mean score of 3.9 on a scale of 1 – *not at all* to 5 – *extremely* important issue. Organizations from North Carolina and Tennessee reported climate change as being the most significant issue with a mean of 4.5, indicating it as a *significant* or *extremely* important issue. South Carolina reported a mean of 4 – *significant*, and Virginia a mean of 2.5 – *slightly* to *moderately* important issue (Table 1).

Table 1						
<i>Significance of climate change issue by state</i>						
Significance of Climate Change Issue						
<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina				1 Respondent	1 Respondent	4.5
South Carolina				2 Respondents		4
Tennessee				1 Respondent	1 Respondent	4.5
Virginia		1 Respondent	1 Respondent			2.5

Climate Change Effects

Looking at each effect of climate change individually, and the extent to which respondents believed these types of events were occurring in their area, results all indicated that they were occurring, but in varying degrees. Results indicate that respondents felt that *flooding* was occurring most often in the area with a mean = 3.5 (on a the scale 1 = *not at all* to 5 = *extremely*), followed by *less predictable weather patterns* (mean = 3.38), *severe storms* (mean = 3.25) and *dry spells/wildfires* (mean = 2.75), (Table 2).

<u>Climate Change Effects</u>	<u>Mean Score</u>
Flooding	3.5
Less Predictable Weather Patterns	3.4
Severe Storms	3.3
Dry Spells/Wildfires	2.8

When the results are broken down by individual climate change effect categories and viewed across individual states, differences are noted. For example, *severe storms* were indicated as most often occurring in South Carolina and Tennessee with 100% of respondents reporting them as *significant* (score of 4). North Carolina reported *severe storms* as “moderate” (mean of 3), followed by Virginia with a mean of 2 (slightly), (Table 3).

<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina		1 Respondent		1 Respondent		3
South Carolina				2 Respondents		4
Tennessee				2 Respondents		4
Virginia	1 Respondent		1 Respondent			2

Dry spells/wildfires were reported to be occurring most often by respondents in Tennessee with 100% reporting *significantly* or *extremely* (mean = 4.5). Respondents in North Carolina reported these events occurring *significantly* (mean = 4), followed by South Carolina (mean = 1.5) and Virginia (mean = 1) indicating *not at all* (Table 4).

<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina			2 Respondents			3
South Carolina	1 Respondent	1 Respondent				1.5
Tennessee				1 Respondent	1 Respondent	4.5
Virginia	2 Respondents					1

Responses indicated that *less predictable weather patterns* were occurring most often in Tennessee (mean = 4.5), followed closely by North Carolina (mean = 4). South Carolina reported “moderate” occurrence (mean = 3) and finally Virginia with “slightly” (mean = 2), (Table 5).

<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina				2 Respondents		4
South Carolina			2 Respondents			3
Tennessee				1 Respondent	1 Respondent	4.5
Virginia		2 Respondents				2

Flooding was reported to be occurring most often by respondents from North Carolina and Tennessee (mean = 4). Respondents from South Carolina reported flooding occurring *moderately* or *significantly* with a mean of 3.5, while Virginia respondents reported flooding occurring *slightly* with a mean of 2.5 (Table 6).

<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina			1 Respondent		1 Respondent	4
South Carolina			1 Respondent	1 Respondent		3.5
Tennessee				2 Respondents		4
Virginia	1 Respondent			1 Respondent		2.5

Climate Change Positive and Negative Effects

Sixty three percent reported that there were no positive effects to tourism from climate change for their region (Table 7). Sixty three percent also reported that there were moderate negative effects of climate change on tourism in their region. Eighty three percent of the sample stated some type of weather issues as the most significant impact of climate change on tourism, namely as to how it impacts nature-based tourism or special events. Respondents were also asked to estimate a dollar amount of tourism dollars lost or gained due to climate change in an open-ended question. From the sample, only two responded with \$20,000, and \$5,000 reported as lost revenue due to climate change effects in the past year. No one reported any tourism dollars gained due to climate change.

Table 7					
<i>Amount of Positive and Negative Effects of Climate Change</i>					
<u>Evaluation</u>	1 <u>Not at all</u>	2 <u>Slightly</u>	3 <u>Moderately</u>	4 <u>Significantly</u>	5 <u>Extremely</u>
Positive	63% 5 Respondents	25% 2 Respondents	13% 1 Respondents		
Negative	25% 2 Respondents	13% 1 Respondents	63% 5 Respondents		

Future Trends of Climate Change and its Effects on Tourism

Respondents were also asked to report on how they believed climate change would affect tourism in their business or organization specifically over the next 10 years. Forty three percent said that climate change would not affect their business positively, while fifty seven percent said that climate change would affect their business moderately in a negative way (Table 8).

Additionally, forty three percent said that climate change would affect their business significantly in a negative way over the next ten years.

<u>Evaluation</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>
Positive	43% 3 Respondents	43% 3 Respondents	14% 3 Respondents		
Negative		14% 3 Respondents	57% 4 Respondents	43% 3 Respondents	

When looking at the predicted positive and negative effects of climate change by state, additional insight is gained. In North Carolina and South Carolina, 100% said climate change would *not at all* or *slightly* affect tourism positively over the next ten years. While in Tennessee, one respondent said climate change would affect tourism positively *not at all* over the next ten years, and the other respondent said it would affect it *moderately*. Meanwhile in Virginia both respondents said that climate change would affect tourism *not at all* positively (Table 9).

For negative effects, both North Carolina and South Carolina said that climate change would *moderately* affect tourism negatively over the next ten years, while both of the Virginia respondents said it would *not at all* affect tourism negatively (Table 9). Tennessee fell in the middle with one respondent reporting that climate change would *slightly* affect tourism negatively and the other saying it would *moderately* affect tourism negatively.

Table 9						
<i>Positive and Negative Effects of Climate Change on Tourism</i>						
<u>State</u>	<u>1</u> <u>Not at all</u>	<u>2</u> <u>Slightly</u>	<u>3</u> <u>Moderately</u>	<u>4</u> <u>Significantly</u>	<u>5</u> <u>Extremely</u>	<u>Mean</u> <u>Score</u>
North Carolina						
Positive	1 Respondent	1 Respondent				1.5
Negative			2 Respondents			3
South Carolina						
Positive	1 Respondent	1 Respondent				1.5
Negative			2 Respondents			3
Tennessee						
Positive	1 Respondent		1 Respondent			2
Negative		1 Respondent	1 Respondent			2.5
Virginia						
Positive	2 Respondents					1
Negative	2 Respondents					1

Visitor Use Patterns and Climate Change

Respondents were asked to report on visitation patterns and if climate change was altering visitor use of their area. Of the sample, 38% said the visitors were coming during different times due to climate change, and reported that visitors are visiting more during shoulder seasons and that visitation is becoming more year round. Visitation also seems to be increasing as 88% of the sample reported that they have seen an increase in visitation over the past three years. Reasons noted for the increase were that places are becoming more year-round destinations, recent fires have brought more people into rental units that are available, and general increases in visitor use.

When visitor use is looked at by state, 100% of respondents from North Carolina, Tennessee, and Virginia all reported visitor increases over the past three years. In South Carolina, one respondent reported increases, while the other reported decreases.

Conclusions and Discussion

This study utilized unstructured interviews to develop a survey to assess perceptions of climate change on a small sample of tourism professionals in four states in the mid-Atlantic. The sample size is very small, therefore making opportunities for generalizations back to the larger population unadvisable, and as such, is a major limitation of this study. The results however do provide valuable insight for tourism professionals in the specific locations in which data was collected, as well as general observations that may be similar to other tourism providers across the region.

It appears that climate change is seen as a significant or extreme issue that is having noticeable impacts on tourism. Flooding and less predictable weather patterns top the list as the most significant impacts of climate change on tourism, though severe storms and dry spells/wildfires were still notable reported impacts.

Severe storms seem to be the most significant impacts to tourism due to climate change in coastal South Carolina and the Smoky Mountains of Tennessee. This is not surprising as coastal areas often take the brunt of hurricane winds, swells, and storm surge, while mountain towns are often affected by down trees, flooding, and power outages. Tennessee and North Carolina both reported that dry spells and wildfires were the most significant impacts from climate change for them. Both samples were in the mountain regions of these states and both have large tracts of national forest on their borders. Gatlinburg also had severe wildfires in 2016 that spread due to excessively dry conditions and unseasonably high winds. It is not surprising this issue is still very salient to respondents in the area.

Tennessee and North Carolina also both reported less predictable weather patterns as very significant impacts due to climate change, as well as flooding. Both issues impact mountainous regions with heavy rains and flooding events. When speaking with respondents from these areas, it was noted that mountain weather is already unpredictable, making outdoor recreation and special events more difficult to plan and execute with success. Add to this the effects of climate change, and the task becomes more challenging.

Few respondents indicated any positive effects of climate change on tourism. The majority noted negative impacts, naming weather-related issues most often. This again seems to be related to the challenges this poses for nature-based tourism and special events.

The future does not appear free of potential impacts to tourism due to climate change. Well over half the sample foresee future negative impacts. Almost no one reported any future positive impacts of climate change on tourism. On the other hand, almost ninety percent of the sample indicated increased visitors to their locations, and that visitor use has also shifted due to climate change. In fact, about forty percent of respondents said visitors were coming in shoulder seasons to avoid effects of climate change – namely unfavorable weather.

Climate and its effects on tourism are real, and appear to be growing. At the initial writing of this paper, hurricane Florence had just passed over the mid-Atlantic, with very significant impacts across the four states involved in this research. Those tourism professionals that were fortunate enough to have gotten by with minimal damage have already begun notifying potential visitors that they are open for business, and ready to welcome tourists back to their locations after brief evacuations and closures. Other tourism sites have not been so lucky. Now, several months later, Hurricane Dorian has left severe destruction in Abaco, Bahamas, and the Southeast braces itself as it slowly progresses toward landfall somewhere along the Carolinas.

Future Research

The two main responses to climate change, mitigation and adaptation, provide one area for future research. Mitigation is exceptionally important, while adaptation seems to be what more tourism

professionals are using in response to climate change. This is likely due to the survivalist nature of a tourism destination. If visitors avoid a location due to climate change impacts, they will seek out other destinations to fulfill their needs. Future research could focus on which responses tourism providers rely on more often, and which, if any, are more successful both short and long term.

This study indicated that shoulder season visitation appears to be growing. It seems that one avenue for tourism providers to seek out is how they can attract and retain visitors during these alternate visitation times. It also seems prudent for tourism providers to diversify their offerings. If a location relies completely on their beach amenities, they may realize that these amenities could be temporarily impaired due to hurricane impacts. Therefore, providing other attractions (e.g., birding, trails, cycling) will help draw visitors that are willing to forgo the beach amenities during these impacted times, but still visit to enjoy the other opportunities available. This is another valuable avenue for future research.

Another idea for climate change adaptation would be to offer rehabilitation escapes for visitors. These could be designed a number of ways, but the idea is to offer opportunities for return visitors (or newcomers) to come to the destination in order to take an active role in helping the recovery efforts after a climate change impact event such as a hurricane, flood, drought, or wildfire. This could certainly provide educational opportunities and rewarding experiences for those who join the efforts. Future research could survey destination travelers to identify preferences and motivational factors for any of these types of experiences.

Climate change and its impacts to tourism are important issues. Tourism professionals are noticing the effects on their sites, their visitors, and use patterns. There is no singular answer on how to adapt to these effects, but a willingness to explore alternate visitation times, diversification of offerings, and opportunities for visitors to share in the recovery efforts may alleviate some of the impacts. Mitigation of the causes of climate change penetrates directly to the heart of the matter, and this is a topic of great importance and avenues of future research.

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