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Perceptions of climate change risk in The Bahamas

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Abstract The Bahamas is considered to be one of the most vulnerable countries to climate change due to its geographic, economic, and population characteristics. While prior research on specific Bahamian resident groups, such as tourism and healthcare workers, has shown limited awareness of climate change, minimal knowledge of specific impacts of environmental change, and low prioritization of environmental issues, in general, there is a lack of studies on the perception of the broader Bahamian public about climate change issues. In this study, over 500 Bahamian residents were surveyed to determine their familiarity with the issue of climate change, specific impacts on The Bahamas, and the perceived levels of risk of these impacts. The majority of respondents were females between the ages of 18 and 30 with some level of college education. The study provides analysis of how climate change is perceived by this subset of the population and potential links with how these perceptions can guide policymaking and risk communication strategies. The study also has implications for other small island developing states, as it contributes to an understanding of the needs for localized data and public education in vulnerable states such as these.

Keywords Public perception · Climate change risk · Small island developing states · Caribbean

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Introduction

Climate change is expected to have significant impacts on small island states, threatening the very existence of some islands as they are exposed to sea level rise, increased flooding, coastal erosion, and changes in habitats (IPCC 2014). Residents of small island developing states are particularly vulnerable to loss of livelihoods, forced migration, and food insecurity due to climate change (Turvey 2007). Understanding the perceptions of island residents about the risks that climate change poses is an important component of policymaking and risk communication and is critical to action on climate change (Lorenzoni and Pidgeon 2006; Carlton and Jacobson 2013). Given the high levels of vulnerability of small island developing states to climate change, it is important to understand how populations in these states perceive climate change. However, there are very few studies on this issue. As a result, this paper will contribute to addressing the gap in the literature and will provide policymakers with guidance on how to craft appropriate policy and risk management communications.

A substantial body of literature exists that focuses on the public perception of climate change risks at the national scale. This literature aids in identifying patterns of perception and concern and allows for analysis of long-term trends in public understandings of climate change for different countries (Wolf and Moser 2011). However, most of these studies focus on more developed countries, particularly the United States, Canada, and European countries (Lorenzoni and Pidgeon 2006; Brody et al. 2008; Akerlof et al. 2010). The public perception of climate change risks in developing countries is not as robustly represented in the literature, and many existing cross-national studies do not include developing countries or small islands (Crona et al. 2013; Vignola et al. 2013; Altschuler and Brownlee 2016).

In small islands, public perception studies have largely focused on small groups rather than on broad assessments of the general public (Lata and Nunn 2012; Rudiak-Gould 2012). In the Caribbean region, perceptions of climate change risk have been assessed for specific social groups, such as tourism industry stakeholders (Belle and Bramwell 2005; Thomas 2012), health care workers (Neely 2012), and farmers (Gamble et al. 2010). Given the different methodologies, questions posed, and analysis, these studies have found varying levels of awareness of climate change and perceptions of the specific risks posed to particular industries. Compared to developed countries, Latin American and Caribbean countries have shown lower levels of climate change awareness overall, but higher levels of perceiving climate change as a serious risk (Lee et al. 2015).

This study addresses gaps in the literature through administration of a climate change risk perception survey which does not target one particular sector of the economy or a specific type of livelihood in a highly vulnerable small island state. Findings from the survey are also linked with potential policymaking and risk communication strategies. An overview of factors affecting perceptions of climate change risk and linkages to policymaking and risk communication is presented, followed by methodological details and results of the survey. Finally, discussion of the results and implications for the development of climate change policies and communication of local climate change risks is provided.

Public perceptions of climate change risk, policymaking, and risk communication

Perceptions of climate change risks are often dependent upon an individual's views, values, and experiences. Personal experience and observations of direct impacts of climate change have been found to influence perceptions of climate risk, resulting in complex and multidimensional understandings of climate change that vary within countries and even communities (Tapsuwan and Rongrongmuang 2015; Van der Linden 2015). Perceptions of climate change impacts are affected by a number of factors including prior experience, environmental awareness, proximity to risk, and existing cultural and ideological values (Bain et al. 2012; Carlton and Jacobson 2013; Altschuler and Brownlee 2016). The reliance on personal experience and ideals to analyze climate risk means that the general public may not utilize analytical and rational processing of the science and facts of climate change (Kahan et al. 2012; Carlton and Jacobson 2013). As a result, public perceptions of climate change risk are often more intuitive and experiential than fact-based (Brody et al. 2008; Van der Linden 2015).

Public perceptions of climate change risks are a fundamental part of policymaking and risk communication on climate change (Carlton and Jacobson 2013; Kim 2011; Hagen et al. 2016; Answani et al. 2015). A thorough understanding of public perceptions on climate change is fundamental to crafting appropriate policy responses as these perceptions create the context in which climate change science and policy operate (Crona et al. 2013). Perceptions of high risk to climate change impacts have been found to correlate to greater support for policy measures to address climate change on national and global scales (Leiserowitz 2006; Dietz et al. 2007). Perceptions of high risk also lead to greater concern about climate change and, as a result, can affect the policy agendas of elected officials (Brulle et al. 2012). If high levels of awareness of climate change exist in small island developing states, populations there will be more receptive to policies targeted as improving resilience.

Climate change is a complex and multilayered phenomenon, and it is therefore difficult to translate into tangible and contextual messages for the public (Answani et al. 2015). As perceptions of climate change risk are dependent on prior experiences and values rather than on analytical processing of scientific information, risk communication should consider the use of emotion, stories, and images instead of presenting only facts (Carlton and Jacobson 2013). Given the diversity of perceptions of climate change risk, communication about the variety of risks that climate change poses should be delivered rather than attempting to communicate about climate change as a single issue (Johnson 2012; Carlton and Jacobson 2013). Perceptions of climate change risk can also be used to tailor messages about the scientific basis of climate change and allow for a more nuanced understanding of scientific uncertainty (Rabinovich and Morton 2012).

While vulnerable communities are likely to be more negatively impacted by climate change, perceptions of climate risk among vulnerable populations and the role vulnerability plays in risk perceptions are understudied (Akerlof et al. 2015; Answani et al. 2015). Previous place-based studies demonstrate that local environmental conditions and local culture matter in a community's perceptions of climate change (Crona et al. 2013). Locally-based studies of risk perception are therefore important and can lead to more culturally and location-appropriate policy responses and offer insights for designing risk communications for those communities. This paper seeks to provide a response to this gap in relation to The Bahamas.

The Bahamas: climate change policies and risk communication

As an archipelagic nation of small, low-elevation islands, The Bahamas is one of the most vulnerable countries in the world to the impacts of climate change (McGranahan et al. 2007; Dasgupta et al. 2009). Physical impacts of climate change,

including sea level rise, coastal erosion, coral reef degradation, and changes in precipitation, temperature, and extreme event intensity, are expected to have dire consequences and may result in significant and permanent loss of land territory (Dasgupta et al. 2009; Holding and Allen 2015). The economic reliance of the country on international tourism and foreign investment along with the concentration of population and infrastructure along the coast increases the potential impacts of climate change (Scott et al. 2012; Thomas 2012). Inadequate human and economic resources also hinder adaptation to climate change impacts and may result in limits to adaptation and permanent loss and damage (Benjamin and Thomas 2016).

While climate change is expected to have significant implications for The Bahamas, there have been limited policy responses by the government. There is one existing policy that specifically addresses climate change—the National Policy for the Adaptation to Climate Change, developed in 2005 (BEST Commission 2005). The policy aims to guide national action to address the impacts of climate change and has a number of directives for how climate change should be addressed in different sectors including agriculture, coastal and marine resources and energy. The development of specific adaptation strategies in many of these sectors is recommended. While some of the directives of the policy have been acted upon, such as the development of a national energy policy that incorporates renewable energy resources, the majority of the policy has not been implemented or enforced (NDP Secretariat 2016). For instance, there has been no development of a national land use and management plan that takes into account the impacts of climate change to regulate the location of development. This has resulted in continuous infrastructure development in vulnerable coastal zones despite the adaptation policy's stipulation that guidelines such as coastal setbacks and stricter building regulations are put into effect (Thomas et al. 2015).

Risk communication about climate change has been limited and has largely been undertaken by environmental non-governmental organizations (NGOs) in the country. These communications mostly focus on education of children and teachers about the potential impacts of climate change in The Bahamas and have included the development of a comic book for middle-school aged children, teacher toolkits, and teacher trainings (BEST Commission 2013; BREEF 2015; BNT 2015). There has been limited public engagement, notably a public service announcement aired on television that was produced through a partnership between the College of The Bahamas and Bahamas Reef Environment Education Foundation, a local NGO (Williams 2014). The National Climate Change Committee, established by the Government of The Bahamas, created and tasked a Public Education and Outreach subcommittee with increasing public awareness about climate change. However, since the committee was established in 2010, there has been no budget provided for public education and outreach, resulting in limited outputs that have relied on financial and personnel support from academia and NGOs. Prior studies on climate change risk perception in The Bahamas have focused on specific social groups rather than on the general public, but they have found that most respondents gained knowledge about climate change from international sources (Thomas 2012; Neely 2012).

Methodology

Participants for an online survey aimed at assessing the perceptions of Bahamian residents on climate change were recruited through emails, social networking sites, and mailing lists. The survey was advertised as focusing on understanding how Bahamian residents perceive changes to the environment. The survey was designed to provide policymakers with guidance on how to craft appropriate policy and risk management communications based on perceptions of climate change of Bahamian residents. Students at the College of The Bahamas also assisted in distributing the survey.

The survey instrument consisted of 24 questions and was designed to assess the general perceptions of Bahamian residents on impacts of climate change in The Bahamas and on a global scale. Ten of the questions were used to verify eligibility and collect demographic information including citizenship, residency, age, and level of education. Fourteen of the questions were focused on determining the familiarity of respondents with the concept of climate change, thoughts on the severity of climate change impacts within The Bahamas and globally, and which climate change effects were of greatest concern. Respondents were also asked to provide their views on the relationships between climate change, flooding, and hurricanes, as inland and coastal flooding along with hurricanes have caused significant damage in recent years (Thomas 2016).

IBM SPSS Statistics was used to provide descriptive statistics of responses, similar to other studies focused on risk perception (Lorenzoni and Pidgeon 2006; Ratter et al. 2012). Cross-tabulations and the Pearson chi-square test were used to determine whether there were statistically significant differences between answers provided by different demographic groups. Using this methodology, a sense of how climate change risk is perceived on a broad scale by residents of The Bahamas was achieved.

Results

Of the 648 total respondents, 541 qualified as Bahamian residents and were used in analysis. The median age of the survey respondents was between 21 and 25 years old. This is slightly

younger than the median age of the general Bahamian population of 29 years (Department of Statistics 2010). Like other developing countries, The Bahamas has a predominantly youthful population. It is this demographic which will bear the brunt of the impacts from climate change, and therefore any policies or actions taken nationally will take effect in their adulthood. The majority of respondents were female, representing a much higher percentage of females as compared to the general population as seen in Table 1. Educational attainment was also higher than the general population of The Bahamas. Educated residents are more likely to have access to information on climate change and share common perceptions on climate change, and years of education has been found to be statistically significant in recognizing the impacts of climate change (Answani et al. 2015; Crona et al. 2013).

Differences between the characteristics of survey respondents and the total Bahamian population are likely due to the use of an online survey that often results in younger and more highly educated respondents (Flaherty et al. 2015). Assistance from students at the College of The Bahamas in advertising the survey also likely resulted in the high rate of young, female respondents, reflective of the student population. The usage of an online survey may have also affected the results of the survey. As opposed to surveys conducted face-to-face at a particular location, online surveys are available to be completed by anyone, regardless of their physical location. This study focuses on the perceptions of Bahamian residents, and questions at the beginning of the survey asked respondents to self-identify as residents of The Bahamas. However, past studies have shown that demographic information provided by online respondents may be questionable, which may result in biased results (Wright 2005).

Table 2 shows results categorized by different demographic groups. Those results that were found to have a statistically significant difference based on demographic variables at the 0.05 level or higher are bolded. As seen in Table 2, although there are some variations in responses between different demographic groups, the vast majority of differences are not statistically significant.

Table 1 Demographic profile variables of survey respondents ($N = 541$)

Category	Number	% Participants	% of total Bahamas population (Department of Statistics 2010)
Gender			
Female	385	71	52
Male	153	28	48
Missing	3	0.6	
Citizenship			
Bahamian	504	93	83
Non-Bahamian	38	7.0	17
Age			
18–30	371	69	20
31–49	130	24	29
50+	38	7	18
Missing	2	0.4	
Educational attainment			
Below high school diploma	10	2	22
High school diploma	158	29	49
Technical school	25	5	7
Some college/college degree	308	57	17
Graduate degree	37	7	3
Missing	3	1	1

Climate change awareness

Participants were asked which of three phrases they were most familiar with. A total of 54% of respondents were most familiar with the term "global warming," 30% were most familiar with "climate change," 7% were most familiar with "greenhouse effect," and 10% indicated no preference for any of the terms.

Scale of climate change risk

Survey participants were asked to use a Likert scale to rate how serious of an impact climate change would have on various spatial scales, ranging from people in other countries to the respondent and his/her family. As seen in Fig. 1, respondents consistently rated climate change as more serious on a global scale and less serious on more local scales. A total of 45% of respondents viewed people in other countries having very serious impacts of climate change compared to 27% of respondents that viewed climate change impacts as very serious for themselves and their family. A total of 75% of respondents indicated that impacts of climate change in The Bahamas would be either somewhat serious or very serious.

Impacts in The Bahamas

Respondents were asked about the likelihood of positive or negative change to different environmental and economic aspects of The Bahamas in the next 50 years due to climate change. As seen in Fig. 2, the majority of respondents, over 80%, foresee negative changes to The Bahamas due to climate change in the next 50 years. The natural environment, including coral reefs, fish stocks, and fresh water, were seen to be most likely to have significant levels of negative change. Social and economic aspects of The Bahamas, including standards of living, tourism, and rates of disease, were viewed by

Table 2 Responses by demographic profile variables

	Climate change awareness: most familiar phrase				Risk	Climate change action			Environment vs. economics viewpoints		
	Global warming	Climate change	Greenhouse effect	No preference	Sea level rise as highest risk	Yes; enough	No; not enough	Not sure	Protect environment	Economic growth	No preference
Gender											
Female	58%	28%	5%	9%	37%	4%	77%	19%	53%	33%	14%
Male	46%	34%	10%	10%	38%	4%	73%	23%	55%	34%	11%
Citizenship											
Bahamian	55%	29%	6%	9%	38%	5%	77%	19%	52%	35%	13%
Non-Bahamian	48%	28%	10%	14%	19%	0%	66%	34%	62%	24%	14%
Age											
18–30	56%	27%	7%	10%	38%	5%	75%	20%	50%	34%	16%
31–49	55%	33%	5%	7%	38%	3%	75%	22%	53%	36%	11%
50+	36%	44%	6%	14%	26%	0%	86%	14%	**82%**	**18%**	**0%**
Educational attainment											
Below high school diploma	40%	30%	10%	20%	0%	0%	100%	0%	60%	30%	10%
High school diploma	55%	30%	6%	9%	30%	4%	81%	21%	46%	35%	19%
Technical school	63%	29%	4%	4%	27%	0%	65%	35%	42%	50%	8%
Some college/college degree	55%	28%	7%	9%	41%	5%	77%	18%	56%	31%	12%
Graduate degree	41%	38%	3%	18%	40%	3%	76%	21%	63%	31%	6%

the majority of respondents as having more moderate negative changes.

Ranking of climate change risks

Respondents were presented with a list of possible effects of climate change and were asked to rank them in order of concern. Sea level rise was found to be of most concern followed by temperature increases, changes in weather patterns, extinction of plants and animals, coral bleaching/coral reef loss, and finally migration of people.

Changes to flooding and extreme events

Respondents were asked about the likelihood that climate change would result in an increase in flooding in the next 50 years. The majority of respondents, 75%, anticipated that flooding would increase. Respondents were also asked about the likelihood of there being more frequent hurricanes and storms in the next 50 years due to climate change. A total of 81% of respondents anticipated that there would be more frequent hurricanes and storms. A follow-up question asked about the likelihood of changes to intensity of hurricanes and storms in the next 50 years. A total of 79% of respondents indicated that there will be more intense hurricanes due to climate change.

Climate change action

The question, "Do you think The Bahamas is doing enough to address climate change?", was asked of participants. This question was kept intentionally vague in order to not focus on governmental action in particular and risk bias of results due to differing political views. A total of 76% of respondents indicated that they did not think that The Bahamas is doing enough to address climate change. Respondents were also asked what they do personally to address climate change. A total of 55% of respondents indicated that they do nothing to personally address climate change.

Environment vs. economic growth viewpoints

Participants were presented with two statements and were asked to select the statement that came closest with their own point of view. A total of 53% of respondents indicated that they agreed with the following statement: "Protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs." A total of 33% of respondents agreed with the following statement: "Economic growth and creating jobs should be the top priority, even if the environment suffers to some extent." A total of 14% of respondents did not know what statement they most agreed with. This was the one question to which there was a

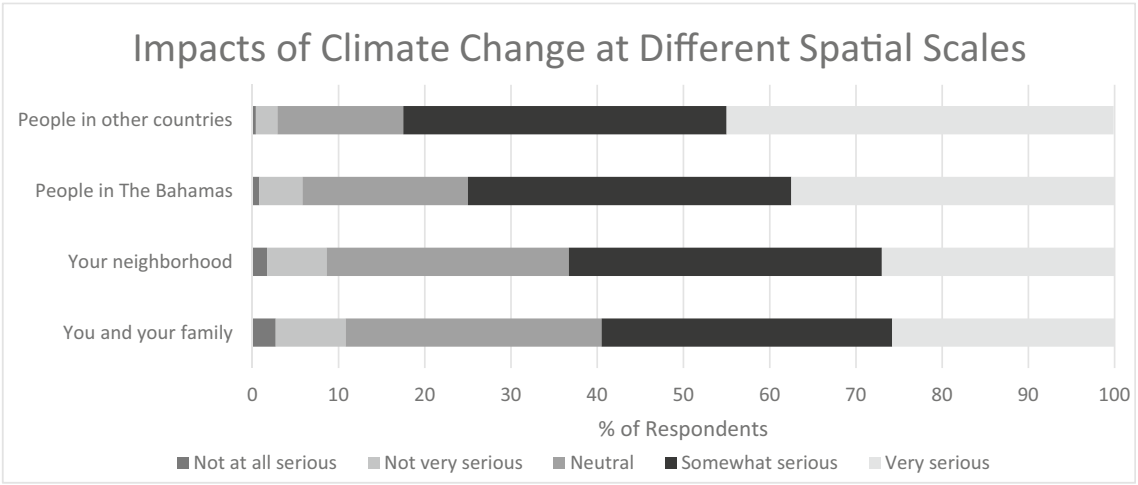

Fig. 1 Percentage of respondents for severity of climate change impacts at different spatial scales

statistically significant difference between different demographic groups. Respondents in the age group of 50 or over were significantly more likely to agree with the statement that prioritized protecting the environment over economic growth, $X^2(4, N = 477) = 14.77$, $p = 0.005$. A total of 82% of respondents in this age group agreed with the statement of prioritizing the environment.

Discussion

Respondents to this survey demonstrated a high level of awareness of the phrase "global warming" or "climate change" with 84% of respondents indicating that they were familiar with either of these phrases. Compared to other respondents in developing countries, this is a relatively high level of awareness. For example, Kim (2011) cites an average of 57% of respondents in developing countries who had heard of global warming, while Lee et al. (2015) record that over 65% of respondents in developing countries such as India, Nigeria, Egypt, and Bangladesh had not heard of climate change. Prior studies focused on specific groups of Bahamian residents showed differing levels of climate change awareness. Thomas (2012) found that less than 50% of hotel owners were aware of climate change and had any idea of the implications of climate change for their businesses. However, in a study of hotel and hospital workers, Neely (2012) found that the majority of respondents were aware of climate change.

Climate change is often characterized as a "distant" risk that is more relevant to other people (Van der Linden 2015). For example, in a study of Pacific Islander University students, results showed that the natural environment in the rest of the world was considered to be in worse condition than

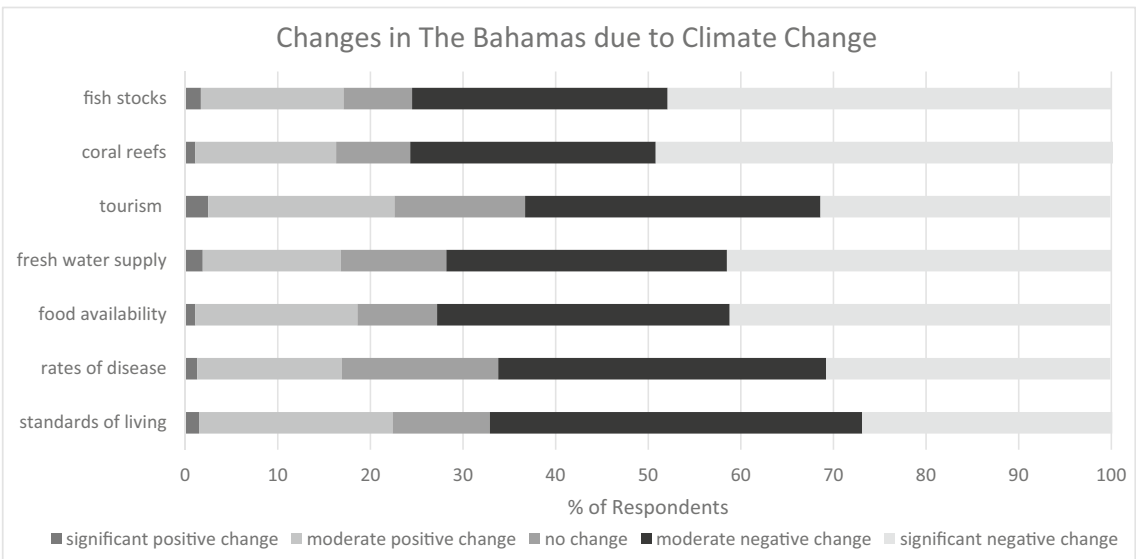

Fig. 2 Percentage of respondents for changes in The Bahamas due to climate change

their island nation, demonstrating a "spatial optimism bias" based on a worldview that other places are worse off (Nunn et al. 2016). However, while these Pacific Islanders expressed a higher level of global versus local concern about climate change, the vast majority of the respondents believed climate change would affect them personally. In another island-based study, residents of Koh Tah island in Thailand who were involved in the dive industry believed their community was not currently vulnerable to climate change and its impacts were in the distant future (Tapsuwan and Rongrongmuang 2015). Residents surveyed in this study fell somewhere between these two studies of island residents in terms of spatial bias. Respondents in The Bahamas believed that climate change was a more serious threat to the global community rather than at a local or individual scale, demonstrating some of the characteristics of spatial optimism bias. However, the majority of respondents in The Bahamas did foresee significant changes to environmental and economic aspects of the country due to climate change in the next 50 years.

Respondents listed sea level rise as their greatest concern regarding climate change, followed by temperature increases. This is consistent with global trends that physical vulnerability associated with location, for example vulnerability to sea level rise or vulnerability to high temperatures, affects perceptions (Brody et al. 2008). Residents who are most vulnerable to sea level rise see climate change as a greater risk (Brody et al. 2008). Proximity to coastline was the strongest predictor of risk from floods in a survey of households in The Philippines (Combest-Friedman et al. 2012). This contrasts with respondents in a survey carried out in Thailand, where very few participants mentioned marine impacts such as sea level rise, coral bleaching, coastal erosion, or ocean acidification (Tapsuwan and Rongrongmuang 2015).

Interestingly, although sea level rise was ranked as the greatest concern for respondents of this survey and 75% of respondents anticipated that flooding would increase, migration of people was of least concern. Low levels of concern for migration do not reflect the high levels of population that are at risk to loss of land. Approximately 90% of the population of The Bahamas resides in the low-elevation coastal zone, which is particularly at risk to sea level rise and will likely result in the need for relocation of communities (McGranahan et al. 2007). Low levels of concern about migration may indicate that the public does not fully understand the potential impacts of sea level rise in displacing communities and infrastructure located in coastal areas. These findings illustrate widespread knowledge on the general impacts of climate change, but lack of awareness on the potential severity of those impacts.

Although most respondents thought that not enough was being done to address climate change in The Bahamas, more than half of them also indicated that they have not taken any personal action to address climate change. Again, this is in line with global trends. There is a generally weak link between environmental attitudes and actions, partly due to what Schoenefeld and McCauley (2015) describe as carbon capability. Carbon capability considers both individual and societal constraints of self-interest as an important precursor to climate action. Although personal threat is linked to support for climate change policies, it is not closely linked in all cases, and values such as self-interest may prohibit individual action on climate change (Schoenefeld and McCauley 2015).

It is important to note the high percentage of young people included in the survey. As future leaders of the country, there is a long-term benefit in assessing and cultivating their knowledge on climate change (Secretariat of the Pacific Community 2015). The attitudes and perceptions of young people towards climate change are also highly relevant to the future direction of policy prescriptions and adaptation efforts nationally. This segment of the population can also be employed to communicate their own concerns about climate change to reinforce messages delivered by decision-makers (Secretariat of the Pacific Community 2015). As a result, this paper does provide useful data to policymakers in relation to designing messages and risk communication on climate change to future generations.

Implications for policymaking and risk communication

The high level of climate change awareness combined with the majority of respondents anticipating high negative changes in The Bahamas due to climate change impacts creates a context where the development and implementation of climate change policies is likely to be supported (Leiserowitz 2006; Dietz et al. 2007). Developing and implementing policies aimed at reducing risk to sea level rise, temperature increases, flooding, and extreme events can also address the perception by respondents that The Bahamas is not doing enough to address climate change. The existing National Policy for Adaptation should be revised to reflect advancements in climate change vulnerability and adaptation knowledge, publicized to inform the public about what needs to be done and implemented to ensure that adaptation begins to take place.

Prior studies have found that emphasizing personal responsibility for climate change can lead to guilt, denial, sadness, and cognitive dissonance, which can lead to further inaction (Obradovich and Guenther 2016). Given the already low level of personal action taken to address climate change, pursuing collective responsibility approaches to climate action in The Bahamas may be more fruitful than emphasizing personal responsibility. The development of policies that encourage action at the community level or broader scales may therefore be more effective in addressing climate change.

Given the high awareness of general risks of climate change, nationally scaled communication that focuses on the particular, locally scaled risks of climate change for The Bahamas may be helpful. This locally specific risk

communication may aid in improving the understanding of residents about climate change impacts for the nation and address the spatial optimism bias of respondents who see The Bahamas as less at risk to climate change than other places in the world. Contextualizing how sea level rise will impact coastal zones may also assist in increasing the understanding of how the majority of Bahamian residents will be affected.

Communication that utilizes images, stories, and values that are culturally relevant to the Bahamian context may aid in framing climate change risks for the general public (Scannell and Gifford 2013; Neely 2012; Carlton and Jacobson 2013). In developing countries, climate change has to compete against other pressing issues such as poverty reduction, unemployment, economic advancement, and corruption (Sovacool 2012). Therefore, it is essential that climate change risk communication focuses on the specific impacts of climate change that are important and relevant to Bahamians. Involving young people in crafting messages about climate change would aid in the development of new and innovative forms of communication that focus on culturally relevant storytelling, including role plays, TV dramas, and flashmobs, which may better capture the attention of the population and better explain the relevance of climate change to their lives (Secretariat of the Pacific Community 2015). A recent video documentary produced by the NGO BREEF, which highlights the experiences of children with Hurricane Matthew and links this extreme event to general climate trends, is a good example of this type of national communication. Previous climate change communications that have been developed for teachers and students and focus on specific Bahamian issues can be used as a basis for the development of broader-scaled risk communication.

While the study does provide important insights on the perception of Bahamian residents to climate change risk, there are a few limitations to the study. Firstly, the average age, gender distribution, and education of participants did not directly correlate to the general Bahamian population. Respondents to the survey were younger, predominantly female, and more highly educated than the general Bahamian population. Future studies may need to utilize representative sampling and a combination of paper-based and electronic surveys in order to ensure a closer representation of the Bahamian population. Secondly, the survey did not enquire as to which island participants resided on. As an archipelagic nation, the populace of The Bahamas is spread unevenly over a number of islands, some of them being more urbanized than others. The perceptions of residents from lesser developed and populated islands may differ from those of the more developed islands. Subsequent studies should ensure that these perspectives are captured to ensure even geographical representation from across the country.

Conclusion

Climate change cannot be separated from its effects and impacts on everyday lives (Buijs 2010). Climate change stressors are mediated and interact with local, site-specific characteristics (Bunce et al. 2010). Impacts and perceptions are therefore highly localized. Misconceptions and confusion over the causes and impacts of climate change can lead to maladaptation and even inaction (Tapsuwan and Rongrongmuang 2015). Understanding the perceptions of climate change among residents in a highly vulnerable country is therefore critical to developing and implementing appropriate responses to climate change. Understanding these perceptions is also important in executing vulnerability assessments (Altschuler and Brownlee 2016). Adaptation planning should be a mixture of both top-down and bottom-up approaches, combining both scientific and local knowledge (Answani et al. 2015). Residents in vulnerability communities may have unique insights into the most appropriate adaptation strategy for their local circumstances and therefore may assist in implementing the most efficient and flexible adaptation strategies (Altschuler and Brownlee 2016). Incorporating the views of local communities can also be empowering and can more effectively link local to global adaptation strategies (Altschuler and Brownlee 2016; Nunn et al. 2016).

As people do not perceive climate change as a 'monolithic risk' (Carlton and Jacobson 2013), risk communication should be differentiated according to locally relevant hierarchies of risks and impacts and therefore be catered to local circumstances. Localized risk perceptions should be taken into account when developing both global and local climate change policies and strategies (Hagen et al. 2016). National, geographic, and cultural factors are highly important in shaping individual perceptions of climate change (Lee et al. 2015). As a result, local studies on risk perceptions provide a 'window of opportunity' to forecast the degree of support that will be given to climate change policies, as well as the public's willingness to adopt these policies and engage in altered, more climate-friendly, behaviors (DeBono et al. 2010). Governments need the assistance of the public in implementing climate change policies, and therefore risk perceptions should be taken into account by decision-makers (Tien 2013). The public is likely to be more receptive to adaptation and risk communications if they are culturally appropriate (Nunn et al. 2016). Policies should be crafted to suit local areas and communities and be relevant to them. They must be tailored to nationally specific contexts, particularly in the developing world, to ensure active citizen engagement (Lee et al. 2015).

In contrast to the high vulnerability of The Bahamas to the impacts of climate change, there has been insufficient policy development and implementation and limited public education about climate change risks. While the country is a party

to the United Nations Framework Convention on Climate Change and has ratified the Paris Agreement, locally scaled policy action is insufficient given the country's high degree of vulnerability. However, as this study demonstrates, there is high awareness of the general risks of climate change, although potentially not of the possible severity of its impacts, among Bahamian residents. This study therefore demonstrates that Bahamian residents may be highly interested and receptive to risk communication on climate change, as well as actions to implement climate change policies. This provides an opportunity to policymakers to take action to create culturally appropriate communications on climate change and revise and implement nationally appropriate policies and strategies on climate change adaptation.

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