The Impact of Rising Sea Levels on The Bahamas- A Cause for Concern

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Abstract

This paper will discuss how the rising sea levels will impact the Bahamas through a literature review. Additionally, this paper will present primary research, which includes recent measurements of sea levels/beach erosion from several beaches. Interviews with Bahamian residents and environmentalists will also be presented to understand how natives view this phenomenon. While climate change may not be concerning to all, the natives of the Bahamas have considerable cause to worry. Beaches, economies, and the tourism/agricultural industries will suffer losses as a result of rising sea levels. The Intergovernmental Panel on Climate Change projects a 11-98 cm rise by 2100. If this trend continues, the country would disappear due to rising sea levels. Approximately 80% of the land is less than three feet above sea level, with shorelines advancing and retreating. According to CaribSave, the entire Bahamas chain is in peril. If major preventive measures don't begin soon, the critical Bahamian tourism industry, which accounts for 60% of the nation's $8 billion economy, could face annual losses of almost $900 million by 2050. As the Bahamas is considered one of the most vulnerable countries in the world to climate change, small changes in sea level can have a huge impact on the environmental, social and economic well-being of every Bahamian.

Keywords: the Bahamas, rising sea levels, economy, tourism, thermal expansion, beaches

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Introduction

According to the Intergovernmental Panel on climate Change, Climate change is defined as follows:

> a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer and encompasses any change in climate over time, whether due to natural variability or as a result of human activity. (Climate Change, Sea Level Rise Spurring Beach Erosion, 2012)

When the question arises on the difference between global warming and climate change, one can argue that the two are the exact same thing. According to Cliamte.gov, Global warming refers only to the Earth's rising surface temperature, while climate change includes warming and the side effects of warming—like melting glaciers, heavier rainstorms, or rising sea levels. Said another way, global warming is one symptom of the much larger problem of human-caused climate change. Global warming is almost always referred to as a man-made way of warming the earth as a result of rapid increase in carbon dioxide and other greenhouse gases from people burning coal, oil, and gas (Climate Change, Sea Level Rise Spurring Beach Erosion, 2012). While, climate change can be caused by man-made changes to the environment, it is more often referred to when discussing the natural changes, the earth makes, such as ice ages (NOAA, 2015). Other than burning fossil fuels, humans can cause climate changes by emitting aerosol pollution—the tiny particles that reflect sunlight and cool the climate— into the atmosphere, or by transforming the Earth's landscape, for instance, from carbon-storing forests to farmland.

It has been proven time and time again that every small change one part of the world can cause drastic results on other parts of the world. Understanding that although, we as a human body many be divided by border-lines, laws, and water; we must all team up and start changing the way we as a people handle climate change. In this fast pace society where technology is ever-evolving, we must team up for the sake of preserving not only man-kind, but cultures as well. Countries like the Bahamas, require help from all parts of the world to ensure that their livelihood and culture can still be embraced and practiced in a country that has not succumb to rising sea levels due to climate change ("The Tribune").

As one of the world giants, and its close proximity to the islands of the Bahamas, The United States of America has one of the largest roles to play in the battle of Climate Change for the Bahamian people. In 2017, President Donald Trump signed a sweeping executive order, intended to shift the direction of the U.S. environmental policy (Dennis & Eilperin, 2017). Despite the many benefits from this bill may have to offer, such as, more jobs for the American people and increase the cash flow into the country; this move will all but ensure that the U.S. does not meet its non-binding international commitments to address climate change and will diminish the country's position as a leader on the issue cultivated under the Obama administration. The executive order undercuts a key part of the nation’s response to climate change, without offering even a hint of what will replace it. This decision can hurt economies as well as potentially terminate smaller countries. Not to mention that, in the Caribbean, many of the economic functions are particularly dependent on the coastal access and resources. Tourist infrastructure is targeted predominantly to coastal sites where inappropriate, siting, design or management can augment vulnerability.

It is widely known that coral reefs protect the coast lines of many islands and smaller countries, however due to the cruises destroying coral reefs, by dropping anchors adding to the rising sea levels, it adds to the issue with the shorelines of the Bahamas being made venerable ("Tourism and Recreational Impacts"). In addition to that, the passage of hurricane Joaquin which devastated the south central Bahamas in October, 2017 dramatizes the vulnerability of The Bahamas. Post Joaquin, the islands in the South Central Bahamas have experienced extensive damages to build environment, infrastructure, homes and schools and significant economic losses in the tens of millions of dollars. The storm has directly affected some 5 – 10,000 people ("The Tribune"). Initial estimates to replace damaged infrastructure are in excess of 60 million dollars. The adverse impacts of climate change were demonstrated and exacerbated by our geographical (limited land masses, low-relief and dispersion of islands) and environmental (high temperatures, storm surges, sea level rise, flooding, tropical cyclones and non-tropical processes) vulnerabilities. Concentration of socio-economic activities, critical infrastructure in narrow coastal zones, dependence on tourism and limited human and institutional capacity are all factors that make The Bahamas vulnerable to climate change.

Problem Statement

There are many factors that contribute to rising sea levels in the Bahamas. Research has shown the causes and effects of climate change and human impact on the environment. However, what warrants further research is the importance those impacted by rising sea levels place on this issue. Recognizing and understanding the reasons why Bahamians may not fully recognize or understand the threat rising sea levels pose will help government officials to better educate and prepare the Bahamas for a healthy future.

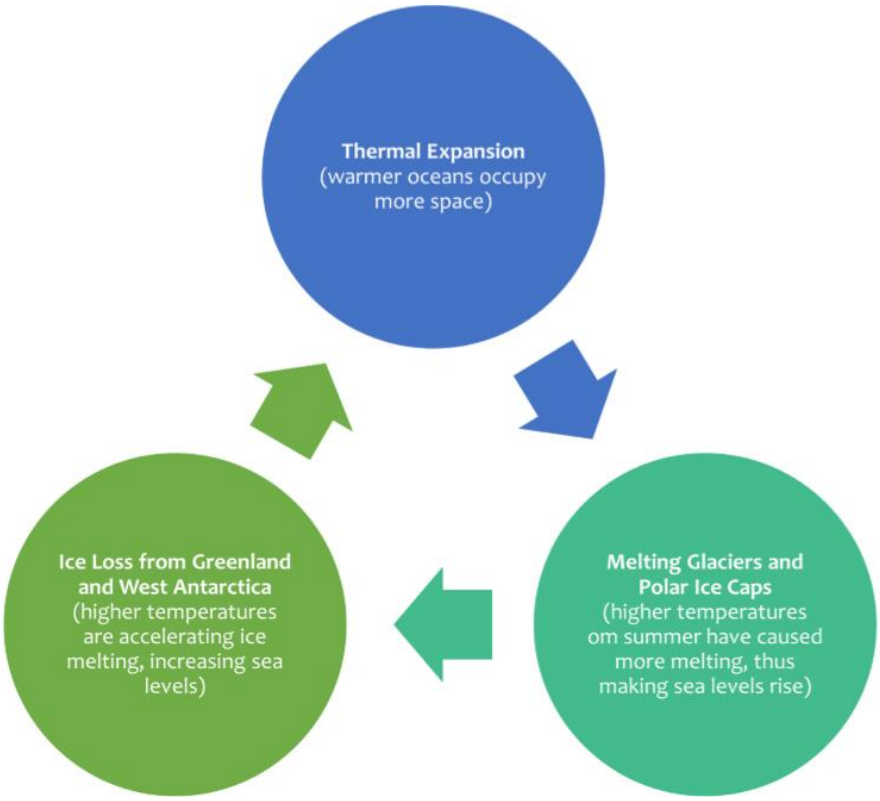
Research Questions.

The following questions will guide the primary research study:

1. How aware are the people of the Bahamas about the rising sea levels?
2. Are Bahamians knowledgeable about efforts to prevent rising sea levels?
3. Are Bahamians in the tourism industry more worried about rising sea levels than those who do no work in the tourism industry?
4. Do Bahamians consider themselves to be environmentally conscious?

The Causes of Rising Sea Levels

Scientists agree that the changes in climate are largely caused by human activity, and its climate change that drives sea levels to rise. Sea levels started rising in the late 1800s, soon after people started burning coal, gas and other fossil fuels for energy. When burned, these high-energy fuel sources send carbon dioxide up into the atmosphere. Carbon dioxide absorbs heat from the sun and traps it, warming the atmosphere and the planet. These emissions have caused the Earth's surface temperature to rise, and the oceans absorb about 80 percent of this additional heat. The cycle chart shows the three main factors that cause sea levels to rise (Frost, 2017).



A Closer Look: The Vulnerabilities of the Bahamas

Soden explains, many of the Caribbean's eastern islands were formed volcanically and have a bit more elevated breathing room. But western isles like the Bahamas chain are just downright flat.

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Concentration of socio-economic activities, critical infrastructure in narrow coastal zones, dependence on tourism and limited human and institutional capacity are all factors that make The Bahamas vulnerable to climate change. (United Nations, 2017).

Literature Review

Prevention Initiatives in The Bahamas

As it stands today, The Finance Ministry in the Bahamas will develop and implement a program of incentives and fiscal measures to enable and support investments in modern facilities and infrastructure in the energy sector; energy efficiency and conservation initiatives; and the further advancement of renewable energy options (National Energy Policy, 2015).

The domestic financial sector will actively seek to participate in investing in energy sector development. A system of shared decision making will be stated and agreed upon. This will ensure that economic decisions that consider energy-related issues are collaborative and would also ensure that those decisions are consistent with the Bahamas National Energy Policy (National Energy Policy, 2015).

In addition to The Bahamas National Energy Policy, the Forestry Act was amended to allow for the establishment of a permanent forest estate. Under the amended Act, 20% of the land cover is designated into one of three categories (forest reserves, protected forests and conservation forests) and will be subject to a management plan for suitable management and environmental conservation (National Energy Policy, 2015).

A Closer Look: Bahamian Forests

The National Forest Estate will deliver global environmental benefits along with domestic livelihood support and human development. GHG emissions from deforestation and forest degradation will be reduced. Results of a mangrove ecosystem study on one Pine Island (Andros) indicate that approximately 5,661,077t CO2eq may be removed from the atmosphere through the proper management of the ecosystem. Proper management will improve the functionality of mangrove ecosystems and increase their carbon sink ability.

Predictions that Cause Concern

"In 50 years, if the [models] are correct, the entire [Caribbean] landscape will be changed," says Ulric Trotz, the CCCCC's deputy director. "Our beaches will have disappeared, our coastal areas eroded, our infrastructure degraded. It would certainly wreak havoc on the way we live" (Padgett, 2016).

Trotz recently co-authored an Inter-American Development Bank report that warns of as much as 1,200 square miles of Caribbean coastal land lost; half the Caribbean Community's major tourist resorts damaged or destroyed by sea rise, surge or erosion; and scores of sea turtle nesting beaches wiped out. Even the airports that receive tourists could be affected (Padgett, 2016).

CARICOM began sounding the alarm in the 1990s as accelerating sea level rise became more apparent. But while CaribSave and other organizations applaud countries like the Bahamas for creating adaptation mechanisms over the past decade, some are critical of the level of resources those governments are committing as well as the enforcement of environmental laws. Groups like CaribSave recommend that the basin's nations begin erecting more than 200 miles of levees and sea walls, at a cost of almost $6 billion (Rolle, 2016).

Barriers to Climate Change Prevention

The Caribbean doesn't have that kind of cash readily available in the best of times -- and these aren't the best of times. The region is currently home to five of the world's 12 most indebted countries (Cadol, Elmore, Guinn, Engelhardt, & Sanders, 2016).

Caribbean governments don't consider that an unreasonable request at all, and here's why: Their region produces less than one percent of the greenhouse gases that many if not most scientists blame for the global warming that causes rising seas (Padgett, 2014).

The Bahamas will require international support in the form of finance, investment, technology development and transfer and capacity-building in its efforts to capitalize on greater utilization of renewable sources of energy and adapt to the negative impacts of climate change that affect various sectors of the economy (United Nations, 2017).

Primary Research

Method

A quantitative method was used to collect data from a larger sample.

Instrument & Participants

Data was collected via a survey with 19 close-ended questions. The researcher randomly asked 100 Bahamians to participate in the survey.

Limitations

Problems encountered were finding willing participants to participate in the survey, which limited the number of participants to 100. Also, as a result thirty-five (35) of the participants currently living in the continent of the U.S., there is a corn that those living outside of the Bahamas might not share the same concern or awareness of those who do live in the Bahamas.

Findings

Number of people interviewed:100

Key:

- = Question
- = Answer

Questions:

1. How old are you?

10% 18-25

40% 25-35

30% 35-45

20% 45 and older

2. What is your sex?

49% Male

51% Female

3. How many children do you have?

25% Two or less

50% Three or more

25% Zero

4. Are you aware that it is predicted that by the year 2050, 80% of the Bahamas will be underwater?

87% No

23% Yes

5. How often have you heard of the impact rising sea levels in the Bahamas?

75% Zero

10% Once

15% More than three times

6. What is your relationship status?

30% Single

50% Married

20% Divorced

7. Does your annual income come from the tourism industry?

67% Yes

33% No

8. Do you consider rising sea levels an actual issue facing the islands of the Bahamas?

98% Yes

2% No

9. Do you think hurricanes play a role in the rising sea levels of The Bahamas?

100% Yes

10. What do you think should be done to slow down the rate of rising sea levels?

13% Efforts to make the topic more widely known should be made

49% We should request assistance from ally countries

38% More research should be done concerning the topic

11. Why do think the impacts of rising sea levels on the Bahamas isn't as well spoken about and as popular as other national issues?

88% It doesn't seem like a current issue facing the country

12% No one is aware of it

12. Do you know of any initiatives that aid to slowing down the rate of rising sea levels?

87% No

13% Yes

13. Do you have a job in the hospitality Industry?

67% Yes

33% No

14. If you knew of any events/initiatives to save the Bahamas from rising sea levels, would you take part?

80% Yes

11% No

9% Maybe

15. Do you consider yourself to be environmentally conscience/ eco-friendly?

76% Yes

20% No

4% Sometimes

16. What do you do for you to consider yourself to be environmentally conscience/ eco-friendly?

36% Recycle

14% Reduce the use of energy

50% Car pool

17. Are you aware of anything the Bahamian government has done to slow down the rate of rising sea levels?

76% No

24% Yes

18. What is your highest level of education?

10% High school

90% College/ University

19. Did you graduate college?

90% Yes

10% No

20. What is your annual earning?

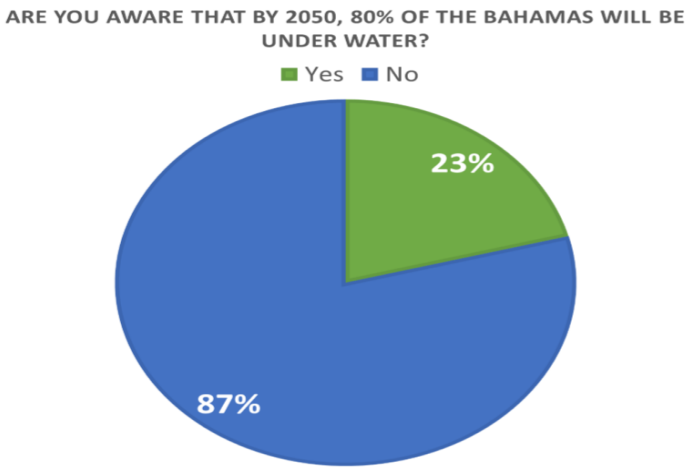
25% <100,000

25% >100,000

50% 500,000+

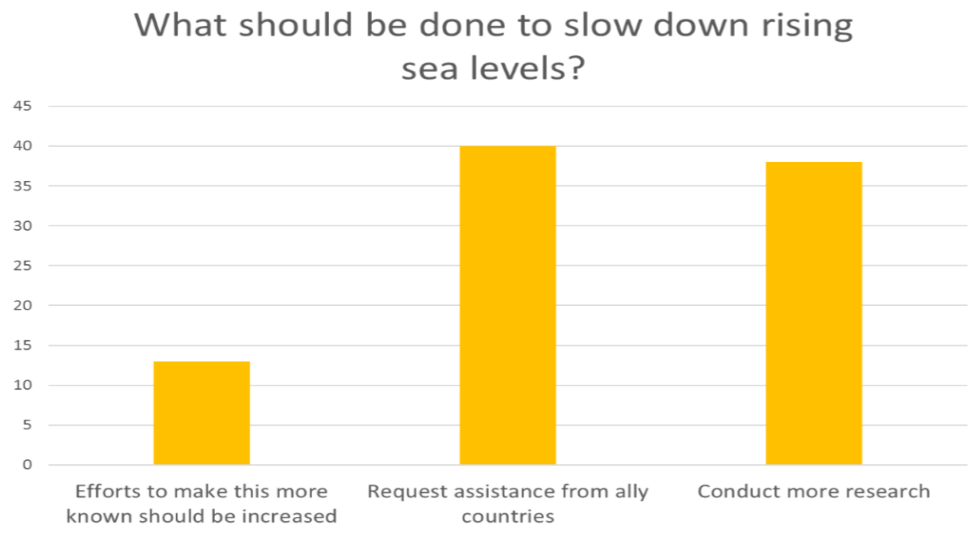
Highlights from Findings

In terms of demographics, 51% were female and 49% were male. The participants varied in age— (40% between 25-35; 30% between 35-45; 20% over 45; 10% between 18-25). 75% of the participants had two or three children. Additionally, 67% of participants' income comes from the tourism industry.



One of the main questions to be answered centered around Bahamian knowledge of rising sea levels.

While only 23% knew the extent to which scientists predict the impact of rising sea levels on the Bahamas, almost all participants (98%) believe this is a serious issue. 100% of participants believe hurricanes play a primary role in this phenomenon



While the fewest people believe efforts should be increased to raise awareness, 100% of participants stated they know of nothing the government is doing to counteract rising sea levels.

Finally, the survey also examined Bahamians' engagement with eco-friendly practices. Participants recycle, car pool, and try to reduce their energy use. The majority of participants are open to partaking in further efforts to prevent Bahamian climate change.

Conclusions and Recommendations

The Bahamas is heading to a watery grave slowly. It is now time to stand up for a change—to fight for the country to last for future generations to enjoy, just as much as the present day natives.

As a result of the country being so small, with limited resources in combating rising sea levels, the Bahamas is often overlooked. Ally nations do not realize the seriousness of this predicament. However, according to this research on its own, it appears that Bahamians might be largely unaware of the dangers rising sea levels pose. If natives do not care, why should anyone else? It is vital that Bahamians raise their awareness and work with the government to better care for the Bahamas.

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