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Antarctica Climate Change and how it affecting the species living there especially penguins.

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Abstract

There has been a lot of change in climate, especially in the Antarctica region. This change of weather has affected the ecosystem of animals living in this area and mainly the penguins. Human activities and other factors such as global warming have caused climate change in this region. This area of the earth is one of the coldest areas with temperatures going very low, and most of the land is covered by ice.

The change in climate in the region has made the area experience increased temperature causing the ground that is covered by ice to melt. This has affected the animals that leave in this area and has led even to the reeducation of the animals.

Key words: Antarctica, Krill, Climate, temperatures, ice, extremes, Penguins

Introduction

Antarctica is a continent that has several climate zones in the world. The continent is bigger than Europe, North America and Australia (Changing climate in Antarctica, 2013). The region comprises of two geographical areas which are the East and West Antarctica. The Great Trans-Antarctica Mountain separates the two regions and also joined together by encompassing ice sheet. It is the coldest continent on earth with its temperatures going to the extremes. It is covered mainly with snow and ice, and its temperatures are freezing the whole year. Its snowstorms can last for days or even weeks making the place a dangerous place to live. It is characterized by extreme cold, high dryness, lots of wind and ice. It has glaciers with cracks large than a football stadium, an ice shelf that is floating and an ice cap that is thicker than ten empire buildings that are stacked on top of each other (Monaghan 2018). Due to the positioning of the Antarctica which is positioned over the South Pole, it receives very minimal sun energy compared to different continents. This is because the earth is tilted towards the sun. The sunny surface of the ice generally reflects the minimum sun energy that is collected. The Antarctic Ice sheet holds approximately 61% of the entire fresh water on the earth. In the East of that continent, the ice sheet rests mainly on the significant land while in the West the extension of the seabed can extend more than 2500 meters below the sea level. The thickness of the ice sheet is 2 kilometers with a maximum being 4800 meters. The availability of the high ice sheet and the polar zone make Antarctica a large warmth sink that without a doubt impacts the air of the whole Earth. Besides, the yearly sea ice spread around the terrain, which every so often accomplishes a district more essential than that of the landmass itself.

It controls exchanges of warmth, sogginess, and gases between the air and ocean and, through salt expulsion when it sets, manages the course of action of cold sea base waters that spread out under the world's oceans. Changes to this system will impact the climate wherever all through the planet (Bartalos, 2017). The measure of snow kept every year on the ice sheet is comparable to around 4.9 mm of global ocean level, just like the mean yearly release of ice once more into the sea.

The area experiences polar summer between the months of end May-Sept and extreme winter between the months of term Nov-March. The northern summer has temperatures of between -20°C and -5°C during the daytime and us the only time one can travel to Antarctica. This is because the temperature is to the extremes during the winter periods that are characterized by extreme temperatures that are cold, violent storms, the darkness that is endless and ice-bound seas (Weather online, 2018).

Climate change in Antarctica is already harming the environment and the animals that leave in that area. Due to the size of the city, the difference in the climate is not experienced uniformly in all the regions. Some of the regions experience sea ice extent increase while in other areas the level of ice is decreasing (Bartalos, 2017).

Climatic change in the Antarctic

The increase in temperature has made the area to experience increased temperature as high as 3°C. This may seem not much, but according to the Intergovernmental Panel on Climate Change (IPCC), this is five times means of global warming. During the past 50 years, the Antarctic Peninsula on the west has rapidly been warming up. The warming does not only have the restriction on the land but is also experienced in the southern ocean. Since 1955 the upper ocean has temperatures of the Antarctic Peninsula have increased to the west by over 1°C.

It is also evident that the Antarctic Circumpolar Current is experiencing more rapid warming more than the worldwide sea in general. The warming is what is causing changes in the environment both physical and to the living animals. As the sea ice gets altered with the climatic shift, the distribution of the penguin's colonies also changes (Slattery, 2017). The melting of the ice due to global warming is affecting the ecology of the region and allowing other animals and plants that are adapted to the warm temperatures to inhabit the area which is changing the native species by causing competition. For instance, the animals that are not habitats of the region start leaving in the region and start colonizing other species. This may lead to the extinction of some species.

The Antarctic continent is a source of home for animals living in the region

Many animals live in the Antarctic, and their lives depend on the weather that the city has, for example, the penguins, whales and the krills. It is approximated that about 20 million different species of penguins live in the Antarctic. Due to the climatic change that the Antarctic is experiencing, it is experiencing a decline in the number of penguins. The reduction varies depending on where they are located in Antarctica, for example, a species are known Adelie penguins that are well adapted for Ice Sea conditions have declined due to the replacement of some water sites. The decline is estimated to be up to 50% in Antarctica (British Antarctic Survey, 2017).

Evans, 2015 agrees that there are species of penguins that are considered to be ice-loving and dependent such as Emperor and Adelie species. This species has reduced in number with the decrease and the loss of sea ice.

The food chain for the penguins and other animals depend on the cold climatic condition

According to the results that were published by the British Survey in 2014, it identified that the number of Krill was also declining. Krills are food to the Antarctic food web, and the decline in the food web threatens the survival of other wildlife such as the whales, seals, and penguins which all depend on Krill for food. Krill's decline has been associated with a decrease in ice in the sea. The ice in the sea plays an essential role in the feeding ground in the Southern ocean for the vast number of the available Krill (Sidder, 2016). Research has established that the number of Krill has dropped to 80% since the 1070s. The reduction of sea ice that is experienced during the winter season is mostly like causing the decline experienced in several species of penguins. The krills food is algae that are found under the surface of the sea ice; these acts as a nursery for the algae (Wolf, 2009).

The decline of the Penguins in the Antarctica

Antarctica is a home to different species of penguins such as the Adélie and the emperor penguins for over 45,000 years. The penguins are adapted to the cold temperatures in the Antarctica region and are suited for the environment. The birds have wings have wings, but they are flightless and can be able to swim and dive. Some penguins such as Gentoo and emperor can dive as low as 35km hour her and 9 km per hour respectively in search of food. Research from the University of Delaware has shown that the recent change in the 21st-century climate has posed a threat to these animals. The investigation further found out that approximately 60% of the Adelie penguins in the region are unable to host colonies in the 21st century (Slattery, 2017). A scientist has found that there has been a decline of approximately 80% in the number of penguins for the last ten years.

Researchers have found out that there is a correlation between penguins and its colonies using statistical models, monitoring trends and climate. The reduction of penguins in the Antarctic is believed to be because of climate change. This is affecting its availability of food and the quality of its nesting habitats. The warming of the seas by global warming may cause the reduction of the penguins' prey those results in the change of the composition of the penguins' diets. Penguins also need cold temperatures as low as -60°C to rear their young ones. When temperatures change and warm up the seas ice, it affects the ice and causes it to shrink causing that penguins chicks that are reared being washed off in the sea and dying. The loss of the Ice Sea for the mature penguins may lead to reduced food which leads to increased mortality.

The change in the climate could likewise decrease the nature of numerous penguin settling destinations by hastening changes in neighborhood climate. Antarctica's atmosphere is commonly chilly, dry, and unforgiving, yet warming could yield uncommon downpour, or rashly dissolve snowfall, making puddles on the ground. Some penguins lay eggs for their production and in areas where the weather is affected and experience more of rain. Then the eggs of the penguins cannot survive. Some of the penguins that do not have the waterproof feathers also die from a disease known as hypothermia.

The change in the methods of farming such as the use of green houses has lead to emission of acidic gases that are causing the ocean to be acidic. This a threat to the ocean food chain for penguins. This is because the ocean absorbs large amount of the carbon dioxide that is produced by the industrial industry. The abundance of seawater acidity has increased to approximately 30% which has made the Sea waters have overabundance carbon dioxide, and carbonate particles have turned out to be less available.

Carbonate particles are utilized by calcifying animals, for example, tiny fish, corals, and shellfishes to assemble their shells. As ocean maturation diminishes carbonate molecule openness, these creatures will end up being continuously vulnerable to develop new shells, and existing shells will begin to break down which leaves these animals with no genuine method to suffer, and along these lines, impacts the penguins' nourishment supply (Worland, 2017).

Factors that have caused the climatic change in the Antarctic

(i) Human Activities

According to Evans, 2015 he explains that the Antarctic has been home to some wild animals and the area has not been exempted to the influences of human activities that have changed the climatic pattern in this area. According to scientist professor James Byrne of the University of Lethbridge who does the study of climate, his findings were global warming due to human made activities (Worland, 2017). He explains that since 1950 due to pollution that is caused by human activities have caused the climatic conditions to change and the ecosystem of the wildlife in the Antarctic to reduce. For example, there has been a decline in the population of the Krill and fish in the waters. The areas in the polar region are warming up faster, and the changes in those areas are drastic. The climatic change has a range of impact on the waters such as acidification which is faster in cold waters, to temperatures that are warming and making the areas to lose the ice.

(ii) Global warming.

Several reasons explain the causes of global warming, and some of the ideas that can solve global warming in the Antarctic area are:

- The fact that there is little liquid water in the Antarctic region means that very little evaporation occurs in the atmosphere. Leaving energy available (that was not used in water evaporation) that increases the temperature in this area at a higher rate.

- As the snow and the ice in these areas melt the black soil, and ocean surface appears. The dark soil always absorbs more heat compared to the lighter surface. The heat that has been absorbed by the dark soil accelerates warming in the Antarctic tundra also.

- There is always transportation of heat to the North Polar Regions by the atmospheric and oceanic currents, and therefore the region has a natural tendency to receive energy that is extra that causes a direct increase in temperatures.

- Heat waves that is global with an extreme El Nino occurrence and the coral reefs bleaching.

How can we protect the Penguins from declining further?

(i) Reducing gas emission from greenhouses.

We need to reduce the emission of gases from the greenhouse since if we continue with the current course of emitting very high gas from the greenhouse, then temperatures will rise to an average of 2.8°C to 4°C which is 4 to 6 times higher in this century compared to the last century. This causes the ocean waters to become corrosive, and sea ice is disappearing in accelerating rate.

(ii) Reducing harmful human activities

As a human, we engage in economic and industrial businesses that some harm with serve side effects to the climate and the environment where we affect the web of life of these animals. For example:

Commercial fishing: where humans engage in the commercial fishery and thoroughly fish forgetting that the Penguins also need food. In the process of fishing, they also strangle the penguins that are underwater and continue to kill them. Spilling of oil in the ocean and other waste materials causes pollution and cutting down of trees.

(iii) Government policies to protect the environment and endangered species.

The government should formulate policies that protect the environment and try to control climatic change. Investment should be more on educating the public about the effects of their human activities on the climatic condition. For Example, the U.S has introduced an Act which is the strongest World's biodiversity law with the most reliable protection law to safeguard the environment and endangered species that are almost facing extinction due to climatic change. In the current Act, one type of spies of the penguin is listed facing endangering of distinction, and the other seven have a proposal for protection (Wolf, 2009).

Nations around the world in the Paris assertion also committed to working together in shielding the temperatures from rising more than 2°C (3.6°F) by 2100 in Antarctica by reducing factors that are creating global warming by human activities. Although it is not clear if the target will be able to be met but it is clear that if nothing is done then the sea levels will rise to an average of 0.2 meters (0.67 feet) by 2100 and some areas like in the U.S are likely to face a higher raise than this according to a recent research (Worland, 2017).

Conclusion.

Research has shown that human activities are what have been driving the climatic change up to 170 times than forces that are natural. Australian and Sweden Scientist have concluded that the impact of human activities such as fossil fuel through the distraction of forest is more important compared to other forces which are natural such as volcanic eruptions, solar intensity, and change in the Earth's orbit around the sun or even a meteorite strike.

The effects of human activities will be felt even years later while the operations were done and forgotten. The climatic conditions have changed, and the weather has become hotter now compared to 50 years ago (Edwards, 2017). If nothing is done during about the human activities that affecting the climate, then the next generation will suffer Bertrand most animals that depend on a particular type of climatic condition will also hurt since the food chain and the living conditions will change. Some distinct spies such as the Adelie penguin spies may be completely wiped off from the surface of the earth. The government should take it upon themselves to protect and educate humans of the importance of environmental conservation practices to empower its citizens and protect the climate.

The reduction of greenhouse gas emission is termed as the most important move to protect global change in climate and protect the penguins. If the current course of activities continues then the temperature may rise to an average of 2.8-4 in this current generation which is four to six times more compared to the past age. This may cause the Sea waters to become more corrosive in many regions which will cause the Antarctic sea ice to disappear at a high rate. This will affect not only the life of the penguins but also its food chain.

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