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U2 Reflective Annotated Bibliography

ENG1101

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How Is Climate Change Affecting Antarctica?

Introduction:

The reason I chose this question is because of how badly the conditions of the earth are decreasing at a rapid pace, but what was more concerning when researching this topic was how a place that is far away from civilization or uninhabited by humans could be affected at a concerning rate like Antarctica. A place where the only permanent inhabitants are animals but not humans and yet the waters of Antarctica are warming and ice sheets and glaciers are falling and melting to expose the greenland that is hidden underneath all the snow. As the climate continues to decline the ecosystem and the species that are living in Antarctica will continue to dwindle. For example species like penguins, Emperor penguins for example, since sea ice is retreating from the region many breeding failures have occurred for these penguins. Out of the five colonies of these penguins, chicks out of four colonies did not make it to fledging's. With this warming more land is being uncovered and water levels are beginning to rise as well, which is concerning for everyone living on earth and with the changing waters.

Source Entries

Citation #1: Fountain, Henry, and Jeremy White. "Rising from the Antarctic, a Climate Alarm." The New York Times, The New York Times, 13 Dec. 2021, www.nytimes.com/interactive/2021/12/13/climate/antarctic-climate-change.html.

<https://www.nytimes.com/interactive/2021/12/13/climate/antarctic-climate-change.html>

Summary: The ocean has a dominant feature, which extends up to two miles deep and is as much as 1,200 miles wide, the Antarctic Circumpolar Current, is by far the largest current in the world. It is the world's climate engine, and this current has kept the world from warming even more. It draws deep water from the Atlantic, Pacific and Indian oceans that have been submerged for hundreds of years, and pulls it to the surface. It exchanges heat and carbon dioxide with the atmosphere before being dispatched again. Without having this current action, the world would be even hotter than it has become as a result of human-caused excretion of carbon dioxide and other gasses. As upwelling gets stronger it would cause more carbon dioxide into the atmosphere, by bringing up the deep water that has trapped carbon for centuries. The southern ocean is also getting warmer and that has another important climate change effect. Since the upwelling of the water is already warm, it flows beneath the ice shelves on the Antarctic coast that helps keep the continents vast and thick ice sheets from reaching the sea at a rapid pace. This means that because of this warm water beneath the ice it is melting it from the bottom of these ice shelves, because of this the sea level is already rising and over time it will continue to contribute much more, potentially with the swamping of coastlines in the next century and beyond. Despite the remoteness of the Southern ocean, with the rest of the world. The flow of the water in Antarctica is in effect where the climate engine is spinning on a continental scale. This new knowledge is alarming researchers because of how the ocean and current may change as the earth continues to warm. One of the most important processes takes place in the southern ocean where the exchange of carbon dioxide between the ocean and the atmosphere. In a recent study it suggested that the southern ocean is absorbing more carbon dioxide than its releasing.

Reflection: While reading this article it gives out a lot of information about upwelling and how much pressure the southern ocean is in especially if it is absorbing more carbon dioxide than it can take and release. As more of this upwelling water reaches and starts to melt more of Antarctica's ice shelves is a big problem since because of this warm water and cold water mixing it causes the ice shelves to weaken, become unstable and fall into the ocean. Reflecting all of this it is scary to think about how the outcome will turn out to be when the ocean absorbs too much carbon dioxide than it can handle.

Quotation “As the world warms, the unceasing winds that drive the upwelling are getting stronger. That could have the effect of releasing more carbon dioxide into the atmosphere, by bringing to the surface more of the deep water that has held this carbon locked away for centuries.” Dr. Russell

Citation #2:

News, Sky, director. Climate Change: Antarctica Could Become Planet’s “Radiator.” YouTube, YouTube, 8 Aug. 2023, <https://www.youtube.com/watch?v=RdKFCQRPZng&t=2s>. Accessed 10 Nov. 2023.

<https://www.youtube.com/watch?v=RdKFCQRPZng&t=2s>

Summary: As Antarctica continues to lose ice instead of being the earth's cooler, it will turn to the earth's heater. In July of 2023 in the Mid-winter of Antarctica it showed a gap around 900 thousand square miles of missing Sea Ice and has been at an all time low all year. In the Antarctic summer in March the sea ice has been falling back as the months go by as the waters begin to warm up . As of last year Antarctica suffered an extreme heatwave of 38.5 degrees, something that is very concerning for the earth's coldest continent. As the Antarctic Ice continues to melt the global sea level will continue to rise as well, In 1990 sea levels rose with 1.81cm. Scientists predict that by 2100 if the Ice continues to melt the global sea level will rise to 17cm putting about 16 million people at risk around the world with coastal Flooding. Antarctica has been protected by global warming until recently because of strong vortex winds spinning high in the atmosphere but now the Antarctic's protectiveness won't be enough to protect the ice anymore.

Reflection: While watching this video it got me concerned about what will actually happen in the next few centuries if Antarctica's ice ceases to exist because of climate change and the warming waters that is causing Antarctica's ice to melt. I've watched other videos about the ice of Antarctica and what would happen if one of the biggest glaciers fell into the ocean and what I heard and saw was that if the most dangerous glacier and also called the doomsday glacier which is Thwaites fell it stores enough water to increase global sea level by almost 3 feet but if the ice that it holds in place falls into the sea the sea level will increase by 10 feet. Also they say that the ice is melting at a stunning rate of 100 meters (300 feet) a year. So hearing all of this is very concerning what that would mean for the future of the earth and everyone here.

Quotation: "What we see now is a start of many worse things to happen in Antarctica and that'll be a tragedy both for the continent but the rest of the planet"(SkyNews Aug.8, 2023)

Citation #3:Rasmussen, Carol. " NASA Studies Find Previously Unknown Loss Of Antarctic Ice- Climate Change: Vital Signs Of The Plane." NASA,NASA, 10 Aug. 2022, climate.nasa.gov/news/3206/nasa-studies-find-previously-unknown-loss-of-antarctic-ice/.

<https://climate.nasa.gov/news/3206/nasa-studies-find-previously-unknown-loss-of-antarctic-ice/>

Summary: As the climate warms the global sea level will continue to rise as Antarctica's ice loss will continue to accelerate as the water and the climate warms. A study showed a map of an iceberg calving has changed Antarctica's coastline in the last 25 years. Researchers also found that the ice sheet is shedding more faster than the ice can be replaced finding, previous estimates of Antarctica's ice loss from its ice shelves since 1997 have been 6 to 12 trillion metric tons because of this ice loss it allows the glaciers to fall more rapidly into the ocean, which accelerates and causes the sea level to rise. Ice shelves

act like buttresses to the glaciers, which keeps the ice from sliding into the ocean. When the ice shelves are stable, they have a natural cycle of calving and replenishment that keeps their size fairly constant over the long term. In recent decades, the warming of the ocean has been declining Antarctica's ice shelves by melting them from below, which is making them thinner and weaker. Satellites measure the thinning process by recording and seeing the changing height of the ice. The losses because of calving have outrun the natural ice-shelves growth so much that the researchers think Antarctica won't grow back to its pre-2000 extent by the end of the century. The Scientists findings suggest that greater losses can be expected. They say Antarctica's largest ice shelves appear to be heading into a bad direction with calving in the next 10 to 20 years.

Reflection: Everytime I read new information about this topic it interests me but yet it makes me scared for what will happen in the future if we don't reverse climate change. If these glaciers melt and calve, what will happen to us if all of Antarctica and the ice fell into the ocean? What will happen with the worst natural disasters? Extreme flooding everywhere. And what will happen to the animals that originate in Antarctica? How would it affect them will they go extinct, will they all cease to exist or will they develop into the new environment that is becoming. So many questions for a palace that we have no knowledge of how it will end up if the waters and climate continue to warm over there.

Quotation: "Antarctica is crumbling at its edges," says JPL scientist Chad Greene, lead author of the calving study. "And when ice shelves dwindle and weaken, the continent's massive glaciers tend to speed up and increase the rate of global sea level rise."

Conclusion:

To sum up everything that had been stated so far, the things that continue to surprise me is how nobody is doing anything to change or prevent this outcome of the ice melting in the Antarctic and how much this can affect everybody living on this earth and how the melting of this continent will affect all of us,

including the animals living there. What especially surprised me was the information that was clear on what was going on like the upwelling of warm waters that are causing the ice shelves to be melted from underneath. Which is why the ice is collapsing.

It is important to know and inform the people on the potential danger that we could be causing if we don't fix this problem and fast especially if what researchers and scientists are predicting on what could happen to the earth like the flooding and the swamping of coastlines, A high rise in sea level which could cause it to raise up to 12 feet, and the organisms that originate in Antarctica and what could happen to them if the melting continues to happen and we don't do anything about it. We are letting this turn into our future and letting the worst thing to happen run its course.

I think the people who need to hear and read this are the factories that are burning fossil fuels and continue using this method of burning and yet don't stop doing it yet I think they know what they are doing and causing is wrong. Along with the deforestation of trees and what it's also doing wrong since cutting down an extensive amount of trees causes air pollution and temperature levels to rise. But in the end I hope they find a way to change this and find a better alternative to make the earth better and back to the way it was to stop the melting of the ice and prevent the outcome that will come to be if we don't stop what we are doing and changing.