



Impacts of Climate Change: Greenland and Antarctic Glacier Loss

CPSG101 Science & Global Change First Year Colloquium II
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Introduction

- The Greenland ice sheet covers about 650,000 square miles and the Antarctic ice sheet covers about 5.4 million square miles, combining for about 99% of freshwater ice in the world
- From 1992 to 2017, they have lost a total of 7 trillion tons of ice, with amount of ice loss per year increasing
- This loss is responsible for approximately a third of all sea level rise
- Caused by increased temperature of ocean waters, which melt the edges of the glaciers, and increased air temperatures, which melt the surface

1



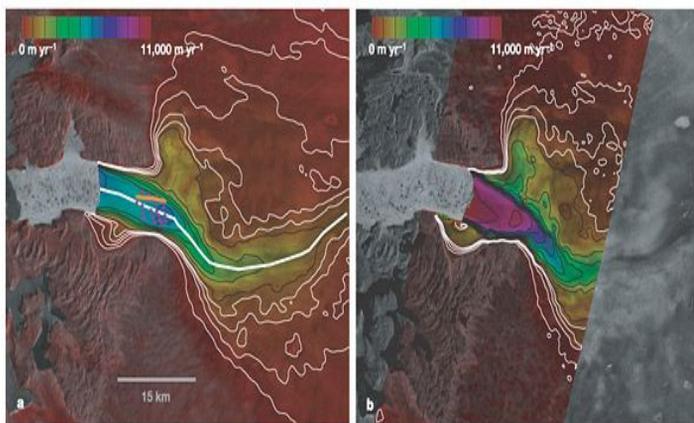
This picture shows a melted water stream through a glacier in Greenland.

2

How Current Global Change is Making This Worse

Some of the main reasons why there has been a loss of sea ice is due to warmer air and ocean temperatures. This warming of the earth is caused by the Greenhouse gas emission that is put out due to human activity. As these conditions get worse, the sea ice will begin to melt at a faster rate. Even if we stop releasing excessive amounts of greenhouse gases, the damage will still continue to persist for many years to come; this will have a negative effect on the livelihood of many people.

6, 7



This image compares the flow speed of ice loss, with purple being the highest. The left is from February 1992 and the right is October 2000.

3



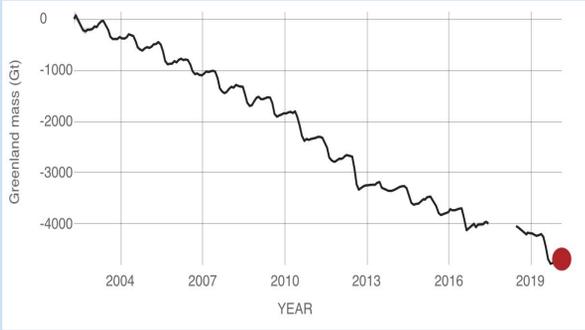


Figure 1: Greenland Ice Mass Since 2002

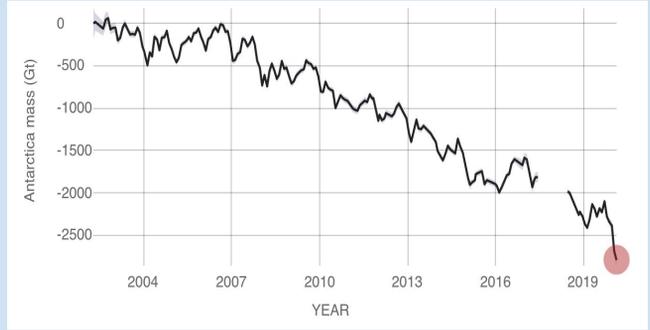


Figure 2: Antarctic Ice Mass Since 2002

How will this change impact humans &/or wildlife in the near future?

If all the glaciers and ice sheets were to melt, it would cause the sea level to rise significantly. 70% of the population lives within 100 miles of the coast and with rising sea levels, comes flooding. Also, many animal species depend on sea ice for their survival by using it to hunt and travel. Less ice will result in the lowering of the animal's population. Fish become more abundant with warmer water, but the growth and health decline, causing humans to get sick if eaten.

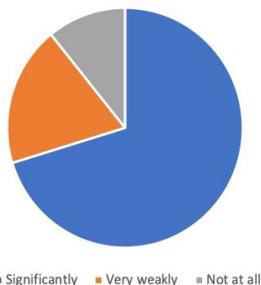


Melting ice is causing serious damage to coastal communities. They are being flooded and the permafrost that they were built on is melting.

During the summer, melting sea ice percolates through the glacier to its base. In doing so, it creates cavities in the existing ice. As these cavities grow, they weaken the overall strength of the ice which results in portions of it breaking off and falling into the ocean.

Another effect meltwater that percolates to a glacier's base has is that it helps speed up the melting of the bottom layer of ice in a glacier. This basal melting makes the glacier increase speed and facilitates increased retreat.

Greenland & Antarctic Glaciers



Various people were surveyed, and this pie chart show awareness of the topic.

References

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