

Skeptic Argument: Antarctic Is Gaining Ice
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Climate change is a rapidly growing problem in our planet today. Thousands of scientists across the world devote their studies to what's causing the climate to change and figuring out the steps that need to be taken to slow down or try to reverse it. But wherever solid evidence is pointing toward the slow destruction of our planet and the blame is directed toward humans, there are sure to be skeptics that can't admit to the truth. One theory that these skeptics try to argue is that Antarctica presently has the most ice ever recorded in thirty years; however, the science shows that while Antarctica may be gaining sea ice, the rate at which land ice is lost has accelerated and this could have a significant effect on sea level rise. The science is there to prove the skeptics' argument is wrong, and this debate would be tossed away had they taken a moment to look at the actual facts.

There is one discrepancy that skeptics tend to look over- the fact that there is a huge difference between sea ice and land ice. Only one type, land ice, is the cause for major concern of rising sea levels. Land ice is the ice that has accumulated *on* Antarctica for thousands of years through snowfall, while sea ice generally forms in the salt-water ocean *around* Antarctica.

In order to argue the point that Antarctica is gaining ice, one must know the facts. The Antarctic is gaining sea ice and has been since satellite measurements began about thirty years ago. But there are specific reasons as to why this is happening. Primarily, it should be pointed out that sea ice is not increasing because the Antarctic is getting colder. In fact, the Southern Ocean is warming at a rate of "0.17 degrees Celsius per decade" (Way, 2010), while the rest of the world's oceans are warming at "0.1 degrees Celsius per decade" (Way, 2010). Since these numbers

prove that it is not cooling around Antarctica, this theory can be tossed out.

However, there are several reasons that do explain the increase of sea ice. “The ozone levels over Antarctica have dropped causing stratospheric cooling and increasing winds which lead to more areas of open water that can be frozen” (What The Science Says, para. 4). The cooling stratosphere above Antarctica causes the cyclonic winds around the continent to increase, which moves around sea ice and creates large areas of open water. These areas, known as polynyas, lead to an increase in the production of sea ice. Also, a possible feedback loop is created since ozone loss leads to cooler temperatures, and cooler temperatures leads to more ozone loss, thus causing sea ice to increase even more around Antarctica.

Another reason that explains the increase of Antarctic sea ice is the change of ocean circulation. “Increased rain, glacial run-off, and snowfall change the composition of the different layers in the ocean, causing less mixing between warm and cold layers and thus melted sea ice ... The Southern Ocean consists of a layer of cold water near the surface and a layer of warmer water below” (Cook, 2010). As learned in class, warming global temperatures causes there to be more water vapor in the air, which then leads to more rain and snowfall. Since the top layer of the ocean is constantly being refreshed by snowfall, the layer below it is more salty and dense. If the warm water were able to rise, it would cause sea ice to melt. But since it is difficult for the cold upper layer and the warmer layer underneath to mix, the layers stay separate from each other preventing the warmer water to rise. Therefore, the upper layer is always very cold preventing sea ice from melting.

As can be seen, sea ice is not a cause of concern for climate change-induced rising sea levels. What we should be worrying about is the decrease in Antarctic land ice, which is the ice that has been stored up for thousands of years on the continent of Antarctica itself. Overall, the amount of land ice is decreasing and is doing so at an accelerated rate. This can cause a rise in sea levels globally, and if our planet were to see a rise of just a few meters, the results would be catastrophic.

Antarctic ice sheets have been measured to be losing mass. Recent measurements shows a loss of “100 Gt/year to over 300 Gt/year” (Way, 2010), which can be responsible for a rise in sea level almost up to 1mm/year. If this rate of loss increases, it can only mean a greater rise in sea level will be seen. As learned in class, Antarctic sea ice is measured to be decreasing in extent, thickness, and volume. Some fairly new satellites have been able to measure gravitational changes to determine the variations of land ice mass in Antarctica. Since these gravity measurements began in 2002, the rate of ice loss has doubled. Therefore, it is clearly observed that the amount of land ice is decreasing rapidly by the year.

Since it has been shown that there is an accelerating rate of decreasing land ice in Antarctica, there is only one determination that can be made- our global climate is warming. Although sea ice is increasing in Antarctica, it has been made apparent that this has nothing to do with climate change (it certainly isn't getting cooler), and that these increases do not effect the rise in sea level. However, the cause for concern is the decrease of Antarctic land ice, which is directly affected by warming global temperatures and will have a considerable effect on sea level rise. Although there may be a few skeptics around the world that would rather ignore

that facts and argue the belief that our global temperatures *aren't* warming, there are many more scientists that know the facts, have seen the data, and are ready and willing to prove that an increase in global temperature is causing our climate to change.

Works Cited

Cook, John. (2010, July). *Skeptical science*. Retrieved from
<http://www.skepticalscience.com/antarctica-gaining-ice-intermediate.htm>

Way, Robert. (2010, November). *Skeptical science*. Retrieved from
<http://www.skepticalscience.com/antarctica-gaining-ice-intermediate.htm>

