

Effects of Climate Change on a Region on Earth



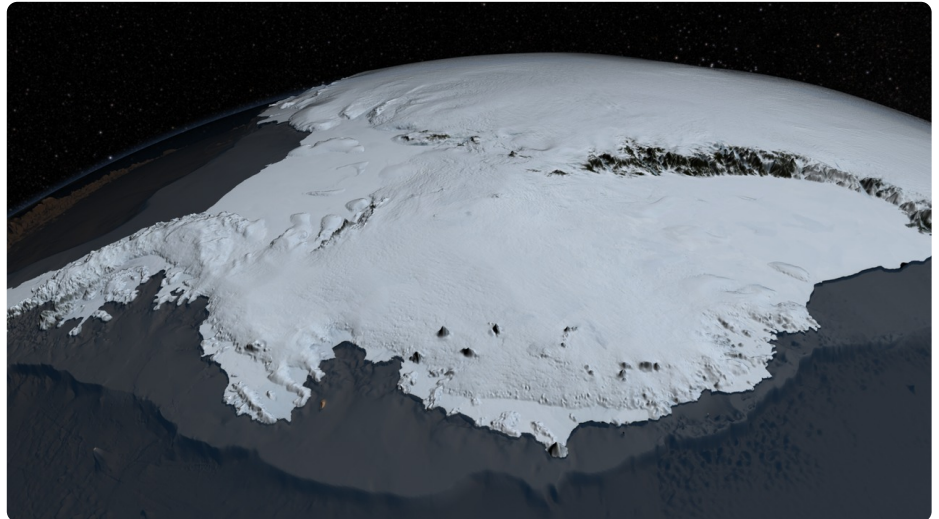
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Antarctic Ice Sheet Meltdown: A Climate Catastrophe

In the early 21st century, the Antarctic ice sheet, a colossal glacier covering 98% of the continent, experienced unprecedented ice loss due to climate change. This massive ice sheet, containing 61% of Earth's fresh water, began shrinking at an alarming rate. The West Antarctic Ice Sheet (WAIS) proved particularly vulnerable to warming, with glaciers like Thwaites and Pine Island losing significant mass. Scientists warned that continued ice loss could lead to a 3.3 to 4.3 meters sea level rise over the next centuries, threatening coastal communities globally.

Economically, the potential sea level rise poses a threat to billions of dollars in infrastructure. Coastal cities may face increased flooding, necessitating costly adaptations. Politically, this event has intensified global discussions on climate policy, urging nations to reduce greenhouse gas emissions to mitigate further ice loss. The social impact is equally profound, as communities grapple with the reality of displacement and the loss of livelihoods.



NASA Goddard's Scientific Visualization Studio [Source](#)

In the subsequent decade, the Antarctic ice sheet's meltdown has become a symbol of climate urgency. Scientists urge immediate action to curb emissions, predicting that without intervention, marine ice sheet instability could exacerbate sea level rise. The Antarctic ice sheet's fate remains uncertain, underscoring the critical need for a collective global response to climate change.

As the ice continues to melt, the world watches with bated breath, knowing that the actions taken today will shape the planet's future. The Antarctic ice sheet's story is a cautionary tale, reminding us of the profound impact climate change has on natural systems and human lives.

Read the above newspaper article on the Antarctic climate changes and take notes: Does the information about melting ice caps and rising sea levels worry you? Why (or why not)? Then discuss in class.

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Antarctica 1800



In 1800, Antarctica was largely unexplored and remained a mysterious land known as 'Terra Australis Incognita'. The continent was entirely covered in ice, with massive ice sheets and towering icebergs dominating the landscape. The climate was extremely cold, with temperatures often plummeting below -50°C . Precipitation was minimal, primarily occurring as snow. The ice mass was immense, and the environment was marked by fierce winds and lengthy periods of drought and snowfall.

Antarctica in 1800 was a land of mystery and extremes, characterized by its vast ice coverage and the harshest climate on Earth.

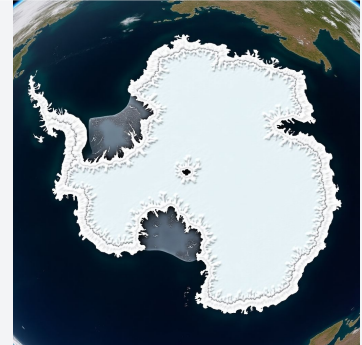
Antarctica 1950



By 1950, Antarctica began to see increased human activity, particularly with the establishment of research stations like McMurdo Station. The continent's climate remained the coldest on Earth, with temperatures in the interior still plummeting to below -70°C . The average annual precipitation remained around 166 mm, predominantly as snow. The ice mass continued to be immense, with glaciers slowly moving towards the sea. Coastal temperatures could occasionally rise above freezing during the summer months. However, the overall environment was still characterized by extreme cold, high winds, and periods of drought and snowfall.

Antarctica in 1950 had begun its transformation into a hub of scientific exploration, yet retained its extreme climatic conditions.

Antarctica Today



Today, Antarctica faces significant challenges due to climate change. While the continent remains the coldest place on Earth, temperatures have risen, particularly along the coastal regions. The ice mass has been decreasing at a rate of about 100 billion metric tons per year, affecting the movement of glaciers towards the sea. Precipitation patterns have shifted slightly, with some areas experiencing increased snowfall. Despite these changes, the environment is still defined by its extreme cold, fierce winds, and the occasional drought periods.

Antarctica today is a critical area for monitoring climate change, showcasing both its enduring icy beauty and the impacts of global warming.

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Changed Climate: A Region in Transition

Read through the reports above regarding the situation in the years 1800, 1950, and today. Then complete the tasks listed below.

Name the major changes in Antarctica's climate from 1800 to today due to climate change.

Describe the impact of human activities on Antarctica's environment since 1950.

Explain how Antarctica serves as a critical area for monitoring global climate change today.

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The future

Make predictions in class about how further developments might look. Will the effects of climate change continue to intensify? What could be done to counteract this?

