



TOPIC: MELTING ICE SHEETS IN GREENLAND AND ANTARCTICA AND GLOBAL SEA LEVEL RISE

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GENERAL BACKGROUND INFORMATION ON THE SUBJECT: Increased atmospheric concentrations of greenhouse gases will lead to warming. A warmer world will be conducive to melting the ice sheets at the poles. That will lead in turn to increased sea level. Ice sheets are thought to melt/form on thousand year time scales. However melting takes place faster than growth. The future rate of melting of the ice sheets on Greenland and West Antarctica is poorly understood because the process is complex, occurs at small spatial scale, and is potentially non-linear. It is possible that the ice sheets will destabilize and melt over time scales of a century, with noticeable changes in sea level over a decade.

TERMS YOU SHOULD KNOW (VOCABULARY):

Greenhouse gas (GHG): Greenhouse gases, like carbon dioxide and methane, trap heat at the earth surface. they are produced by burning fossil fuels, such as coal or oil.

Scenario: A scenario is a set of projected future events that follows certain pre-defined physical or social conditions, such as global warming or business-as-usual.

Ice Sheet: ice sheets are large masses of ice formed by accumulating and compacting snow on land. ice sheets spread outward towards the edge of the continent due to their weight. the flow is very complex and can happen through deformation or basal sliding.

Basal Sliding: flow of ice sheets over the land base. it is much faster when there is melt water or partially liquid sediments.

Ice shelf: ice shelves are platforms of ice resting on the ocean where ice sheets have flowed offshore. at the SEAWARD EDGE icebergs can break off.

Positive Feedback or Vicious Circle: A disturbance causes a positive feedback when it pushes a system further in the same direction.

Nonlinear Process

WHY ARE WE STUDYING THIS IN THE POLAR REGIONS? Most of the frozen water on that is on land (and can thus affect sea level) can be found in the polar ice sheets.

HOW DOES THIS AFFECT US HERE IN THE UNITED STATES? A large part of United States population lives near the coast. many coastal regions are within a few feet of sea level. for example florida, cape cod, and new york are areas that with even small changes in sea level will see more flooding with storms, and that will lose land for changes of a three feet or more.

ACTIVITY YOU CAN TRY: DIRECTIONS FOR COMPLETING THE EDUCATION TEMPLATE

1. Look at the poster and choose a greenhouse gas (GHG) concentration level. These are related to how national and global economies use energy. This also includes people like you.
2. There are four jars of tokens, representing the outcomes of warming and sea level change for that ghg concentration. pull a token out of your chosen jar. (You can repeat this step to understand the range of possible values and which ones are more probable.)
3. Read the warming and sea level change and decide what area you would like to see. we suggest New York City, Florida, the Netherlands, Bangladesh.
4. go to the corresponding laptop and input the sea level change. watch how the coastline is affected by the rising sea level.