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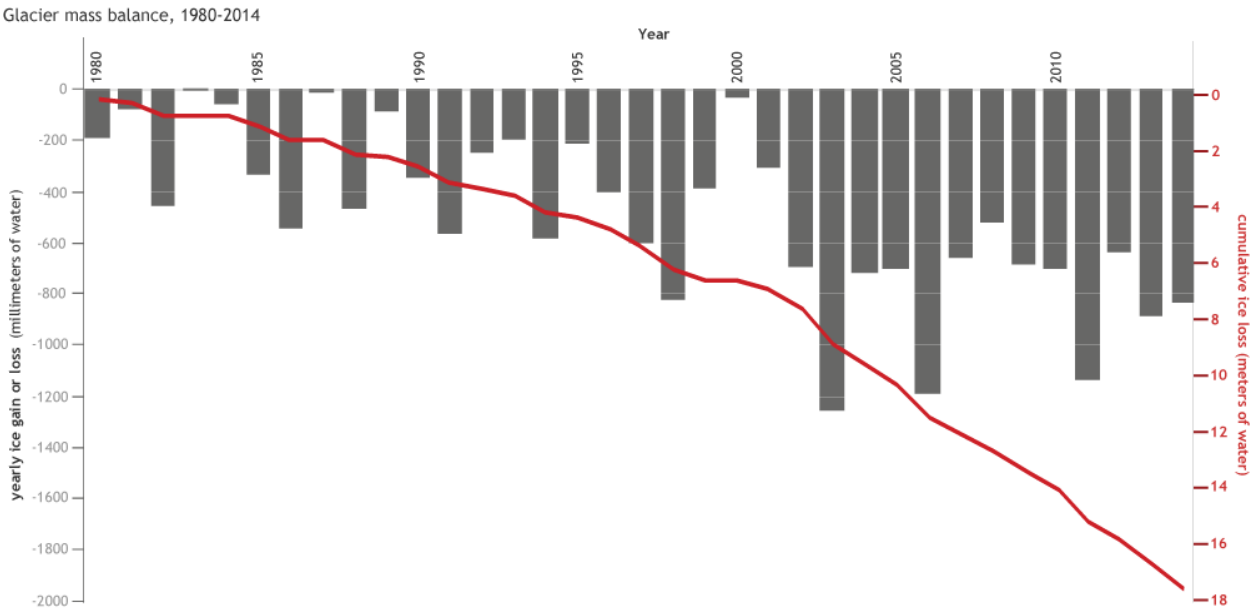
Ocean's Impact on Climate Activity Worksheet

Instructions: While exploring the effects of climate change on glaciers in the Ocean's Impact on Climate Activity, record your findings below. You will submit your completed activity worksheet.

(30 points possible)

Part One

Scientists have studied 37 glaciers since 1980 to collect data on their average mass. Use the research you collected from the two articles and the diagrams below to help you answer the following questions.



1. What was the average yearly ice loss in 1980 versus 2010? *(1 point)*

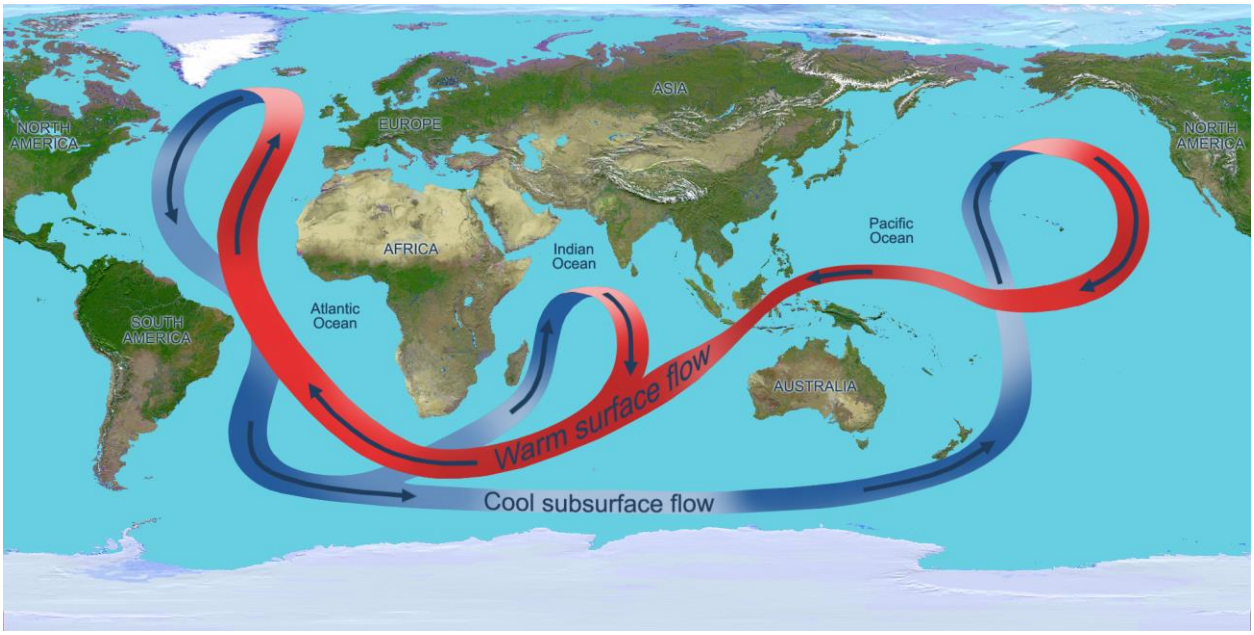
In 1980, it was around 1 meter of water. In 2010, it was around 14 meters of water.

2. What is the overall trend shown in this graph? *(2 points)*

The graph shows that more ice is lost every year.

3. How does a melting glacier affect the ocean? *(2 points)*

Melting ice results in increased sea levels. That can result in things such as coastal erosion and elevating storm surges.



4. Looking at the heat circulation in the ocean, what might happen to it if large amounts of cold water are added in the Polar Regions as glaciers melt? *(3 points)*

This would result in the flow of water being disrupted. With large amounts of cold water being added, this would prevent warm water from flowing North to the other parts of the world.

5. Based on your response above, what effect could this have on the climate in your area? *(2 points)*

If that were to happen, ecosystems around the world would be disrupted. The weather (specifically temperatures) would be affected everywhere as well, since ocean currents regulate the temperatures found outside of the ocean on land.

Part Two

Complete the inquiry chart below by exploring each question in the top row. First, fill in what you think about each question. Then use the lesson and reliable sources to research more about each question. Next, fill in each box with evidence from your sources, and be sure to list the source you used. Finally, pull the ideas together in a short summary on the bottom row. *(20 points)*

Inquiry Chart	How does solar radiation affect climate?	How do the ocean currents affect climate?	How does climate change affect the ocean?	How does climate change affect the biodiversity of marine ecosystems?
What I think	Solar radiation results in the heating of the planet.	Ocean currents help with moving water around the world, which helps to balance the climate.	Climate changes contributes to the rising sea levels.	As climate change affects many habitats, animals are faced with ecological change.
Source 1	"Affects climate through direct heating and the production and destruction of ozone in the stratosphere." (eos.org)	"Ocean currents act like a conveyor belt, transporting warm water and precipitation around the world. Thus, regulating global climate." (NOAA)	"As greenhouse gases trap more energy from the sun, the oceans are absorbing more heat, resulting in an increase in sea surface temperatures and rising sea level." (US Environmental Protection Agency)	"Diminishing ice packs reduce the habitats of polar bears, penguins, puffins, and other Arctic creatures. As the ice melts, it increases the sea level, which will affect and perhaps destroy ecosystems on coastlines." (Sciencing)
Source 2	"It will likely cause Earth to heat up over the next century." (NASA)	"It is the displaced water that affects the air, by warming or cooling it, thereby transferring the same effect to	"Atmospheric warming is leading to the melting of glaciers and ice, causing rising sea levels. (IUCN)	"Ecosystems and biodiversity will be forced to fluctuate along with the regional climate, and that could

		the land surface over which it blows." (Blue Planet Aquarium)		harm many species." (Columbia Climate School)
Source 3	"The absorbed sunlight drives photosynthesis, fuels evaporation, melts snow and ice, and warms the Earth system." (NASA Earth Observatory)	"The ocean's global circulation system plays a key role in distributing heat energy, regulating weather and climate, and cycling vital nutrients and gases." (National Geographic)	"As our planet warms, this ice melts and flows into the oceans. More water in the oceans makes sea level higher." (NASA Climate Kids)	"Less sea ice leads to changes in seawater temperature and salinity, leading to changes in primary productivity and species composition of plankton and fish, as well as large-scale changes in ocean circulation, affecting biodiversity well beyond the Arctic." (Global Issues)
Summary	Solar radiation contributes to the warming of the earth, and many other effects as well.	Ocean currents help to distribute heat energy, which regulates the climate.	Increased temperatures melt ice into water, which raises sea levels.	The effects of climate change lead to changes In many habitats, forcing animals to adapt to big changes.