Resource Cards

Card 1 • Effects of Climate Change on Global Sea Level Rise

Go to:

• <u>http://geology.com/sea-level-rise/</u>

On the map you can see:

- A place to adjust the rise in sea level in the upper left corner
- Areas that the ocean will cover as sea levels rise in blue

To Do:

- 1. Find the United States. Zoom into an area along the coast near the San Francisco Bay area.
- 2. Set the sea level number to 0 M to see what the map looks like with a "normal" sea level.
- 3. Change the sea level to 1M, 2M, 3M, and more. Notice what happens as the sea levels rise higher.
- 4. Explore other highly populated areas in California (for example, Sacramento, Los Angeles, San Diego) to see what effect rising sea levels have on those areas.
- 5. Explore the effects of increasing sea levels in other parts of the United States (for example, Texas, Florida, New York).
- 6. Explore the effects of increasing sea levels in European coastlines (for example, The Netherlands, Italy, England).

Rising global temperatures leads to melting ice in the polar regions, which causes the sea level to rise. As shown, this can cause inhabited areas to become covered by water, which means that millions of people in coastal regions will lose their homes.



Credit: USGS

Discuss and answer the following questions in your science notebook:

The ocean is currently expected to rise 2 meters by 2100. Set the rise to 2 M (meters) on the map.

- What places on Earth will be most affected by a sea level rise of 2 M?
- What places in the United States will be most affected a sea level rise of 2 M?
- How will the area you live in be affected by a sea level rise of 2 M?

Card 2 • Effects of Climate Change on Glaciers



Credit: NOAA

Rising global temperatures leads to melting glaciers (slow-moving masses or rivers of ice). Melting glaciers affect the supply of drinking water of people who rely on *gradual* glacier melt for drinking water. This can cause water shortages for communities and millions of people. Melting glaciers also cause a rise in sea level, which can result in people who live in coastal regions losing their homes.

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- What has happened to the glaciers in these pictures (compare the past picture to the present picture)?
- Why do you think these changes have happened?
- What are some ways that melting glaciers might affect the Earth?
- What are some ways that melting glaciers might affect the people and animals on Earth?

Card 3 • Effects of Climate Change on Risk of Wildfire

To Do:

Read the article below about climate change and wildfire risk.

Is Climate Change Fueling Increased Wildfire Risks?

As the climate warms, dry areas are becoming drier. Spring and summer temperatures are higher and soils are drier for longer periods of time. These conditions increase the likelihood of drought and a longer wildfire season, particularly in the western United States. Hot, dry conditions also increase the likelihood that once wildfires are started by lightning strikes or human error, they will be more intense and burn longer.

Wildfires Are Already on the Rise

Wildfires in the western United States occur nearly four times as often as they did 45 years ago. They also burn much more land area and last longer.

The Earth has always had naturally occurring fires and those caused by humans. However, many of the areas that have seen an increase in fires—such as Yosemite National Park and the Northern Rockies—are protected from or mostly unaffected by human land use and behaviors. This suggests that climate change is a major factor driving the increase in wildfires.

As the World Warms, We Can Expect More Wildfires

Wildfire seasons (seasons with higher wildfire potential) in the United States are projected to lengthen. For example, the fire season in the Southwest has increased from about 7 months a year to all year long. Additionally, wildfires themselves are likely to be bigger.

Wildfires are very costly. For example, between 2000 and 2009 the property damages from wildfires averaged \$665 million per year. In addition to the property damage, it costs states and the federal government millions of dollars to fight the fires and try to prevent them. The more fires, the more people lose their homes or suffer from lung diseases caused by the smoke and pollution.



- What does the article tell you about the relationship between climate change and wildfires?
- Why have wildfires increased?
- Identify ways wildfires affect the Earth.
- Identify ways wildfires affect people and animals.

Card 4 • Effects of Climate Change on Animal Life on Earth

Rising global temperatures and increased carbon dioxide can affect plants, which are food sources for many animals. For these reasons, animals either migrate toward the Poles or eventually die out. Watch the videos for specific examples.

To Do:

(3)

Watch the following two video clips about the ways animals are affected by climate change. Take notes about the videos as you watch.

- How Does Climate Change Affect Animals?
 http://tinyurl.com/climatechangeanimals (2:13)
- Pikas and Climate Change
 <u>http://www.smithsonianmag.com/videos/category/science/pikas-and-climate-change/?no-ist#ooid=tlcmpnMj</u>
 <u>q-EXI2SF863HbH0dF-MQ7BaY</u> (3:02)





- Describe different ways climate change is affecting animals on Earth.
- What effect has climate change had on the pika? Why?
- What are different ways humans can help animals that have been affected by climate change?
- How will harm to animals due to climate change affect humans?

Card 5 • Effects of Climate Change on Extreme Weather Events

To do:

Analyze the scientific models of what scientists predict will happen in your lifetime (from 1970–1999 to 2071–2099) if climate change continues as it has.



Credit: NOAA NCDC / CICS-NC

- Describe the changes in precipitation (rain) in your area, in your state, and in the United States.
- Describe the changes in the number of dry days in your area, in your state, and in the United States.
- Compare the low CO₂ emission temperature change map with the high CO₂ emission temperature change map.
- Choose one of the maps and discuss what effect the changes shown could have on the area you live in. Focus on farming, recreation, industry, tourism, and activities you like to do.

Card 6 • Effects of Climate Change on the Amount of Food that Crops Can Produce

To Do:

Analyze the graph below that shows the **projected** (meaning expected) amount of food produced in the future.



Projected Effects of Climate Change over Time on the Amount of Food that Crops Produce

Source: IPCC AR5 Synthesis Report

Increased global temperatures and decreased rainfall will cause a decrease in production of many crops. This decrease will most likely lead to food shortages and conflict between humans because of limited resources.



- From 2070 to 2089, what percentage (approximately) of crops is expected to increase (in tan) their production?
- What percentage is expected to decrease (in red) their production?
- What story is the graph telling you?
- Based on the projections on the graph, what are two ways that climate change is expected to affect the amount of food that crops will produce on Earth?
- What are ways less food production will affect the Earth?
- What are ways less food production will affect people?