# DANGER ZONE

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STUDENT WORKBOOK



# TIME IS MELTING AWAY

Most of the effects of climate change have an indirect relationship that will play out over the course of years. Let's investigate one of the effects of rising temperatures: rising seas.

#### LEARNING GOALS:

I can use a model to show changes in the energy going into and out of Earth's systems cause changes in climate.

I can use evidence to explain how current rates of regional and global climate change allow people to predict future effects on Earth's systems.

I can use evidence to show how changes in climate have affected the occurrence and severity of natural hazards as well as human activity.

# MELTING ICE

#### By Land and Sea

As the temperature on Earth warms, ice melts and oceans warm. In this experiment, you will compare the rising water levels of sea ice and land ice.

# WHAT YOU NEED:

FROM THE KIT:

- 2 graduated cups
- 2 containers of modeling dough

**OTHER ITEMS:** 

- Ice cubes
- Water

### WHAT TO DO:



1. Remove both colors of modeling dough from the package and form them against the inside of each graduated cup. Make sure the modeling dough resembles a small cliff that can hold the ice cubes.



2. In one cup, place two ice cubes at the bottom pushing them to fit beside the dough; this will represent sea ice.



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**3.** In the other cup, place two ice cubes firmly on top of the small cliff; this represents land ice.

While there are many downstream effects of melting ice, a significant impact is felt in coastal communities. As you learned in Activity 1, cities like Annapolis experience higher flood levels due to these rising sea levels. Cities along the Gulf of Mexico and Atlantic Ocean have the highest rate of change for coastal sea levels. Many of these communities are over 100 years old, with historic buildings and critical services threatened by increased flooding.





Data source: NOAA (National Oceanic and Atmospheric Administration). 2021 update to data originally published in: NOAA. 2009. Sea level variations of the United States 1854–2006. NOAA Technical Report NOS CO-OPS 053. www.tidesandcurrents.noaa.gov/publications/Tech\_rpt\_53.pdf.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

Water is stored on Earth in two main parts of the ecosystem: the cryosphere and the hydrosphere. The **cryosphere** is the part of Earth that contains frozen water, such as sea ice, glaciers, snow cover, etc. The **hydrosphere** is the part of Earth that contains liquid water, such as oceans, rivers, ground water, etc. These two systems interact with the atmosphere through the water cycle.

## SHOW WHAT YOU KNOW

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In this image you can see an entire town located directly next to the sea. A few dozen homes, shops and a pier. The town is at the bottom of a steep coastal cliff, with only one road in and out, and families have lived in the area for generations.

**?** 1. Describe the impacts that this town would face with rising sea levels, including potential damage, access to transportation, food, and other resources.

**?** 2. Based on your list of issues, make a suggestion to move the townspeople or build a solution to prevent damage from sea level rise. Explain.

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Kit	SU-DANGER
Instructions	IN-DANGERS
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