

## Activity: Applications of Geologic Maps

### Instructor Background

#### Objective

Students will analyze components of geologic maps to consider how they are used to inform construction and other needs of human populations.

#### Materials

- ◆ computer with internet access

#### NGSS

DCI: Earth Materials and Systems

SEP: Analyzing and Interpreting Data, Developing and Using Models, Engaging in Argument from Evidence

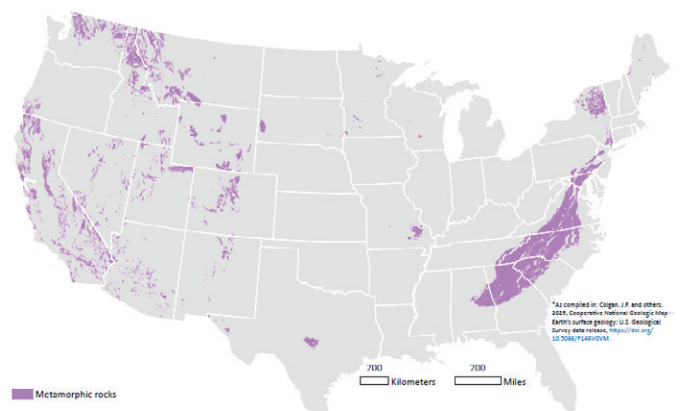
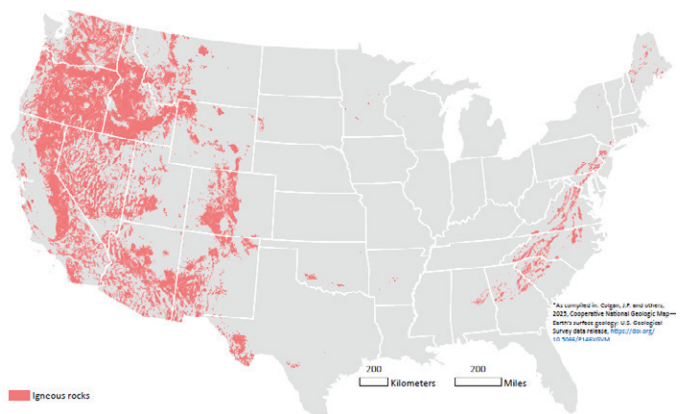
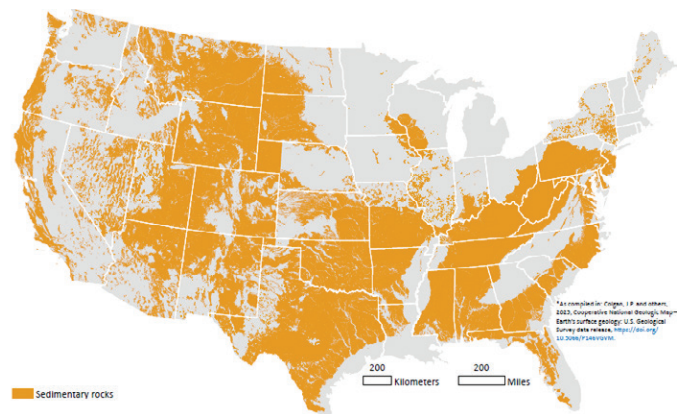
CCC: Structure and Function, Systems and System Models

#### SDGs

3: Good health and well-being

9: Industry, innovation, and infrastructure

11: Sustainable cities and communities



Geologic Map layers showing specific surface rock types across the contiguous United States.

Credit: As compiled in: Colgan, J.P. and others, 2025, Cooperative National Geologic Map—Earth's surface geology: U.S. Geological Survey data release.

## Steps

**1. Reading a Geologic Map:** Use the **Geologic Map of Kentucky from 1988** (enlarge the image or download the pdf) to describe the types of rocks found in the state. Then access the **Interactive Kentucky Geologic Map** to see how it has been updated and to use a variety of features.

- ▶ Click "Menu" in the upper left corner, then click "Layers".
- ▶ Click "Standard Geologic Map", then scroll down and turn off all layers except "Bedrock Geologic Map Layers" by clicking on them (layers that are off with have a line through the eye icon).
- ▶ Click the arrow next to "Bedrock Geologic Map Layers" to expand the menu, and turn off all layers except "1:500,000 Geologic Units". Then turn on the "1:24,000 Geologic Units" Layer and describe how the map differs. Discuss what you think the scale means (1:500,000 versus 1:24,000).

**2. Applications of Geologic Maps:** Open a second window/tab to have two copies of the Interactive Kentucky Geologic Map at the same time. View the 1:500,000 Geologic Units map on one window and the Radon Potential Map layer on the other.

- ▶ Discuss any correlation you see between the two maps. What types of rocks are in the areas with the highest radon levels? With the lowest? How might someone use this information?
- ▶ Click through other layers to see what types of hazards and resources have been mapped in Kentucky.

▶ Imagine you are planning to build a house in Kentucky. Use information from the Geologic Map Layers to make an argument on where the best location to build would be. Consider natural hazards shown on the geologic map layers, as well as other aspects of life including proximity to schools, green spaces, public transportation, and shopping, and statistics like crime rate and cost of living.

**3. Analyze Your Geologic Map:** Use the **National Geologic Map Database (U.S. only)**, **Macrostrat**, or another online resource to look for geologic maps of your area.

- ▶ What geologic hazards have been mapped in your area? How could these hazards affect human health or safety?
- ▶ Is there any correlation between where natural hazards occur and where people tend to live? How can people use geologic maps to help determine the best places to live?
- ▶ Imagine you are relocating within your state. Use information from the geologic map and other maps of your state to make an argument on where it would be best to live and why.