

18

Evaluating Site Risk

TALKING IT OVER

IN THE FIRST activity of this unit, you learned about the nuclear waste storage problem in the United States. Throughout this unit, you have learned about what must be considered when deciding where to store nuclear waste. Based on current recommendations by experts, it is likely that the country will search for one or two sites to build underground facilities for the long-term storage of nuclear waste. In this activity, you will gather data about four sites being considered for the long-term storage of nuclear waste.

The United States wants to have a long-term storage facility for nuclear waste selected and built by 2040. Use what you have learned in this unit to help you evaluate four possible sites under consideration. Which site would you recommend for further study? What are the trade-offs of your recommendation?

GUIDING QUESTION

How can we use evidence to decide where to store nuclear waste?



MATERIALS

For each group of four students

- 1 Student Sheet 18.1, "Four Proposed Sites"

For each student

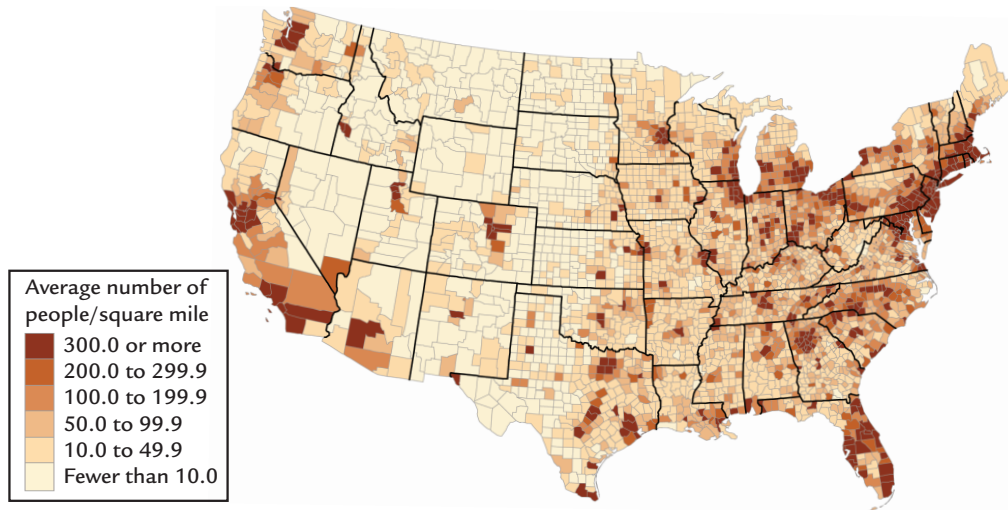
- 1 Student Sheet 1.1, "Considering Where to Store Nuclear Waste" (completed)
- 1 Student Sheet 18.1, "Four Proposed Sites"
- 1 Student Sheet 18.2, "Comparing Four Proposed Sites"
- 1 Student Sheet 18.3, "Discussion Web: Evaluating Site Risk"

PROCEDURE

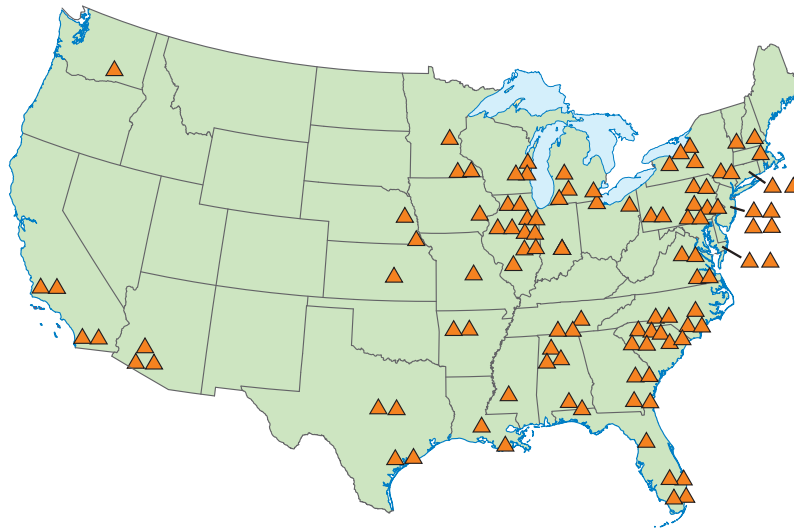
1. Work with your group of four to complete this activity. Remember to listen to and consider the ideas of the other members of your group. If you disagree with others in your group, explain why you disagree.
2. Your teacher will distribute Student Sheet 18.1, "Four Proposed Sites." This map shows the locations of the four proposed sites for long-term storage of nuclear waste.
3. In this activity, you will gather and analyze data about each site from eight maps on the following pages. First, look at each map and its key carefully. Then, look for patterns across the maps. Discuss how any patterns you see might influence your choice of a site to store nuclear waste.
4. Split your group of four into pairs. Assign each pair two of the four sites from Student Sheet 18.1 to learn more about.
5. Work with your partner to gather data about your two sites from each of the eight maps on the pages that follow. Record the data in the table on Student Sheet 18.2, "Comparing Four Proposed Sites."
6. After you and your partner gather data about your two sites, return to your group of four to share what you learned. Listen as the other pair shares what they learned. As you listen, record data about the other two sites to complete the table on Student Sheet 18.2.
7. With your group, discuss the similarities and differences in the data between the four sites using Student Sheet 18.2. Discuss the advantages and disadvantages of each site.
8. Work with your group to come to an agreement about which of the four sites should be studied further.

9. Complete Student Sheet 18.3, “Discussion Web: Evaluating Site Risk.” Use your data from the maps as evidence to support your decision about why this site should be studied further. Discuss the trade-offs of your decision.
10. Present your group’s recommendation to the class.

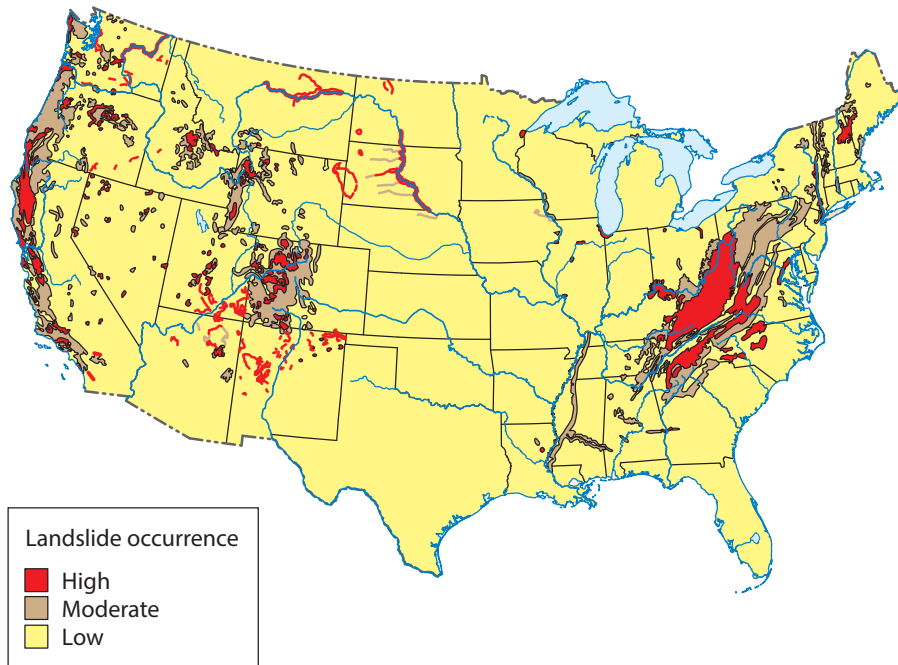
Map 1: Population Density by County in the Contiguous U.S.



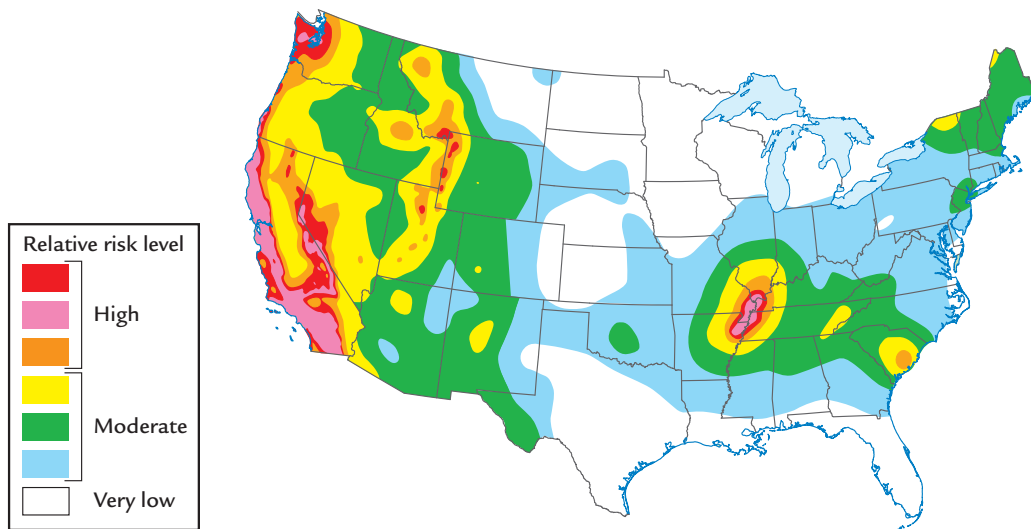
Map 2: Locations of Operating Nuclear Reactors in the Contiguous U.S.



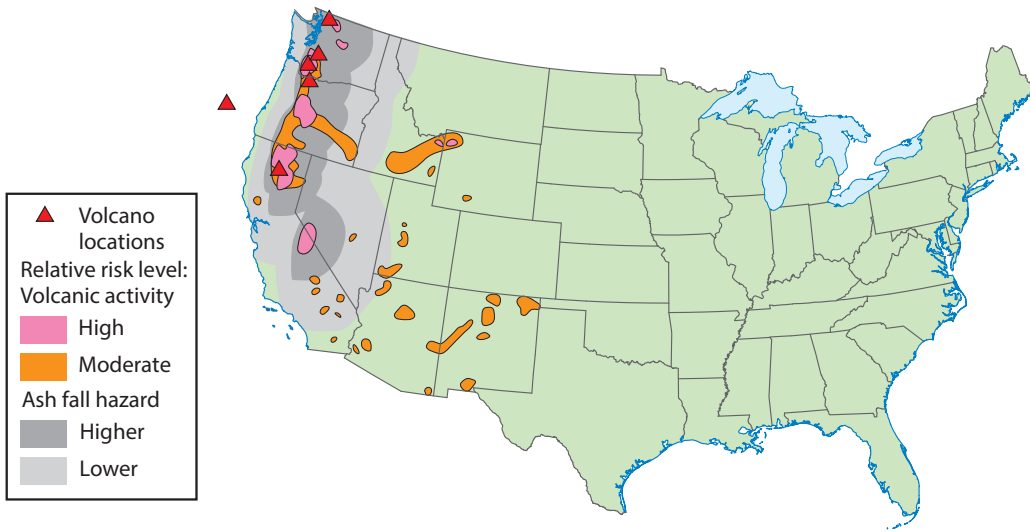
Map 3: Landslide Hazards in the Contiguous U.S.



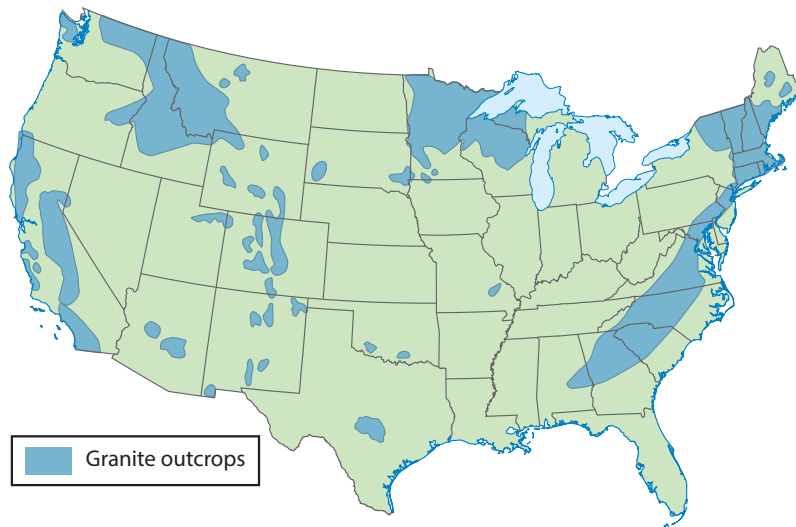
Map 4: Earthquake Hazards in the Contiguous U.S.



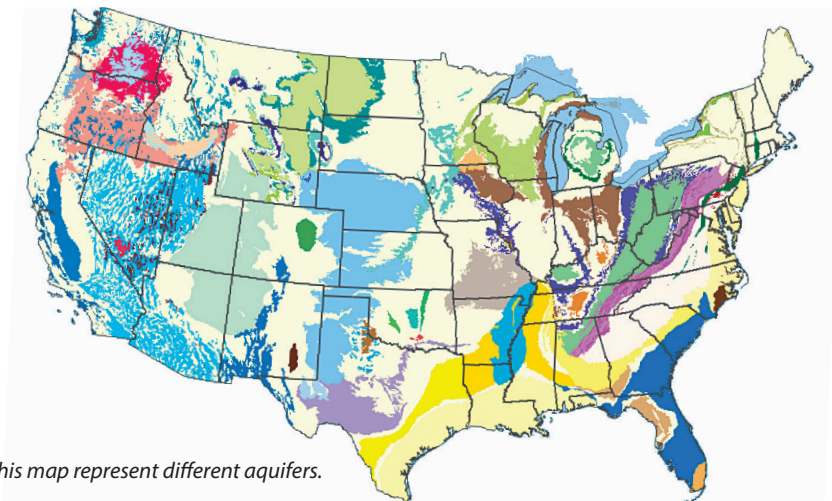
Map 5: Volcano Hazards in the Contiguous U.S.



Map 6: Granite Outcrops in the Contiguous U.S.



Map 7: Aquifers in the Contiguous U.S.



The different colors on this map represent different aquifers.

Map 8: Metal Ore mines in the Contiguous U.S.



ANALYSIS

1. Choose a natural hazard that you learned about in this unit. If you had to build a long-term storage facility for nuclear waste in an area of high risk of this natural hazard, how could you use technology to protect the facility from these types of geological events? Explain your ideas.
2. What role do you think people in the community should have when a site near them has been suggested for storing nuclear waste?
3. Which of the four sites would you recommend for further study?
 - a. State the site you would choose.
 - b. Support your decision with as many pieces of evidence as you can.
 - c. Discuss the trade-offs of your decision.
4. **Reflection:** Have your ideas changed during this unit about where to store nuclear waste? How?

EXTENSION

Is there a different site that you would suggest for further study?

Look at each of the maps again, and determine if there is a site that is better than the four you learned about in this activity. Write why you would select this site over the four you learned about in the lesson.

Support your decision with as many pieces of evidence as you can, and discuss the trade-offs of your decision.