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Natural Hazards in the United States: Using Spatial Thinking to Interpret Maps

Background briefing (possible set of oral instructions to the class):

A publisher gave our class a nice set of maps that show where natural hazards occur in the United States. The maps show the locations of tornadoes, volcanoes, earthquakes, and hurricanes.

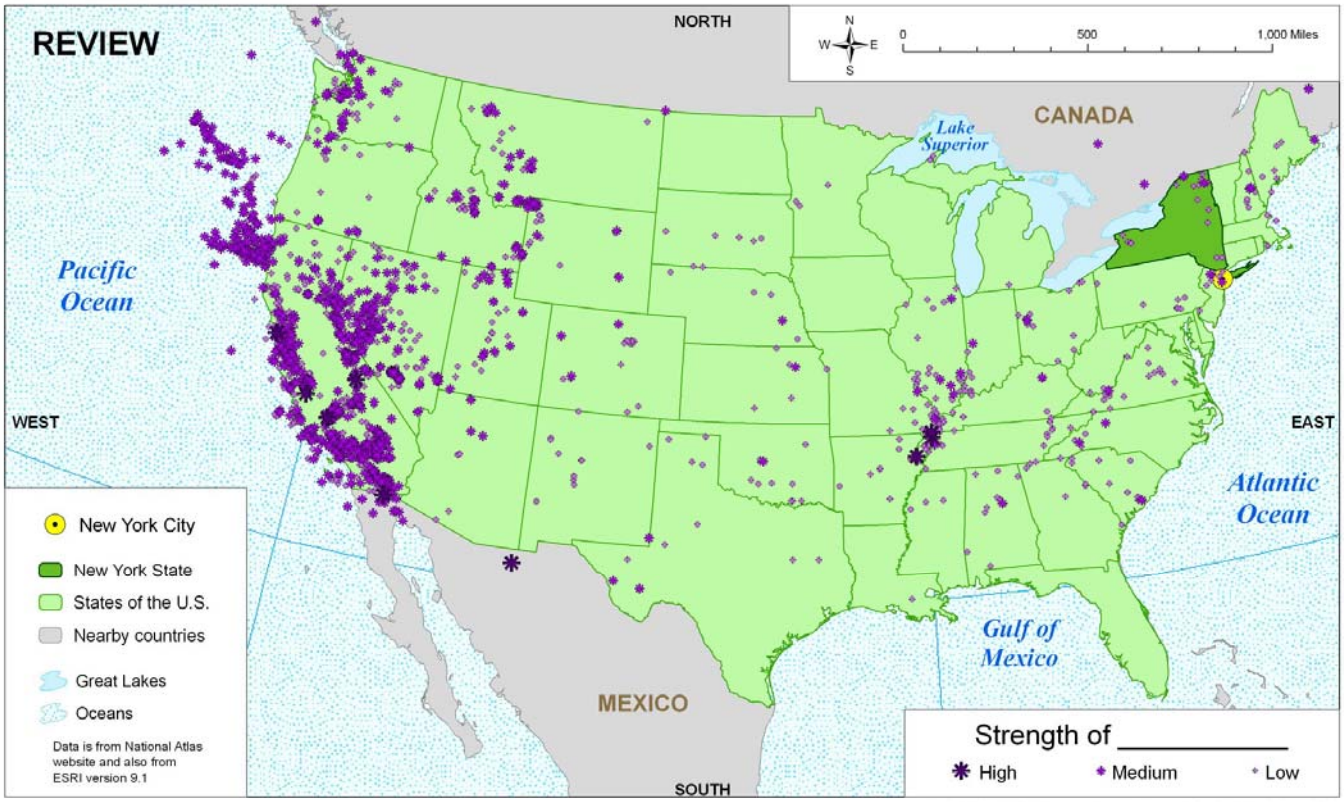
These maps clearly show that some parts of the country have a lot of hazards, while other places seem to be safer. They also show that some places have just one hazard, while other places might have two or three.

These maps could be useful. They could help people make some important decisions. For example, the maps could help people decide how to build their houses, because the maps can tell people whether it is necessary to build their roof strong enough to withstand hurricane winds. The maps can also help people decide what kinds of emergency services they should plan in a particular community.

In short, the information on these maps is important!

Unfortunately, the titles of the maps got lost. The publishers apologized, but I told them not to worry. I said we had some pretty good spatial thinkers in this class. A good spatial thinker can look at a map and study the patterns, regions, and associations on it. Those clues will tell us which map shows which hazard. Then we can use the maps to help us think about how to cope with the hazards.

Underneath each map is a set of five questions. The first three questions are usually easy. They just ask you to review some vocabulary in order to make sure we all know the meanings of some words that people use to describe patterns on maps. The fourth and fifth questions are a little harder. If you use the first three questions as clues, however, they might be able to help you figure out the answers to the harder questions.



This activity page is about using words to describe geographic <u>patterns</u> on a map.

1. Balance or Bias? Are there about equal numbers of dots in all parts of the map, or are the dots biased (unbalanced) toward one side? Circle one:

   Balanced Biased Not sure

2. Scattered or Clustered? Are most of the dots spread out throughout the area, or are most of them bunched together in a smaller part of the area? Circle one:

   Scattered evenly Clustered together Not sure

3. Directional bias? Are most of the dots in the middle of the country, or are most of them toward the coast or border in a particular direction? Circle one:

   Middle North East South West Not sure

4. What do you think these dots show? Circle one:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

5. Why do you think so?

This page is about using words to describe geographic <u>associations</u> on a map.

1. Scattered or Clustered? Are the blue lines spread out everywhere in the area, or are most of them bunched together in a smaller part of the area? Circle one:

   Scattered evenly Clustered together Not sure

2. Association? Do the blue lines occur everywhere, regardless of what else is there, or are they usually associated with particular features? Circle one:

   Everywhere Associated with land Associated with water Not sure

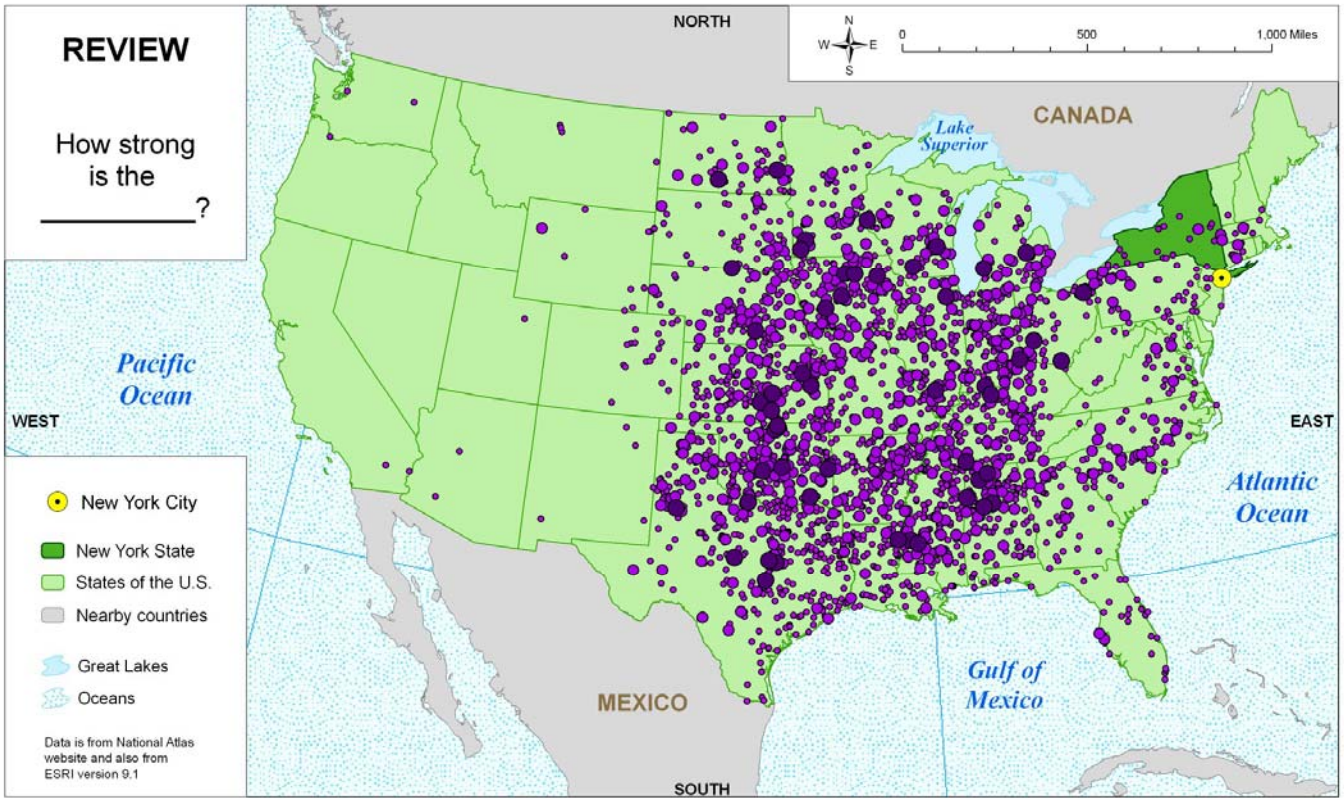
3. What specific geographic features are associated with the blue lines? Circle all of the features where the blue lines are very common:

   Canada Mexico Atlantic Ocean Gulf of Mexico Pacific Ocean

4. What do you think these lines show? Circle one:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

5. Why do you think so?



This page is about using words to describe geographic <u>regions</u> on a map.

1. Scattered or Clustered? Are most of the dots spread out throughout the area, or are most of them bunched together in a smaller part of the area? Circle one:

   Scattered evenly Clustered together Not sure

2. Directional bias? Are most of the dots in the middle of the country, or are most of them found near the coast or border in a particular direction? Circle one:

   Middle North East South West Not sure

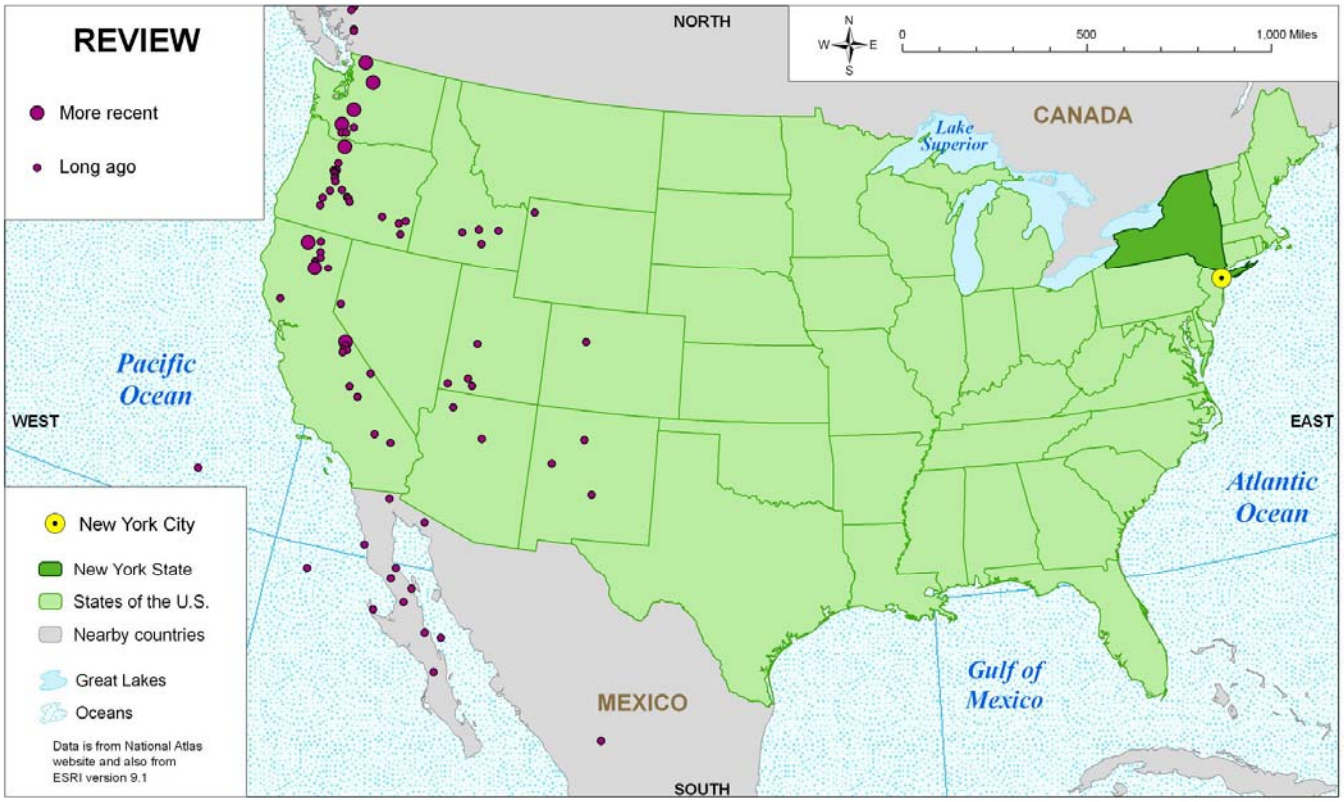
3. Draw a line around the "Many Dots" region on this map. Which three states are inside your "Many Dots" region? Circle their names:

   California Florida Illinois Kansas Maine Oklahoma

4. What do you think these dots show? Circle one:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

5. Why do you think so?



Map of the United States Showing _____ REVIEW

This page of the activity is about using words to describe alignments on a map.

1. Scattered or Clustered? Are most of the dots spread out throughout the area, or are most of them bunched together in a smaller part of the area? Circle one:

   Scattered evenly Clustered together Not sure

2. Aligned or random? Are most of the dots scattered around, or are most of them arranged in rings, lines, or other kinds of groups? Circle one:

   Scattered Pairs Small round bunches Lines Rings Not sure

3. Compare this map with the first one in the set (another dot map). Put an X next to the most accurate statement:

   ___ Most of the dots on this map are in the same areas as dots on that one.

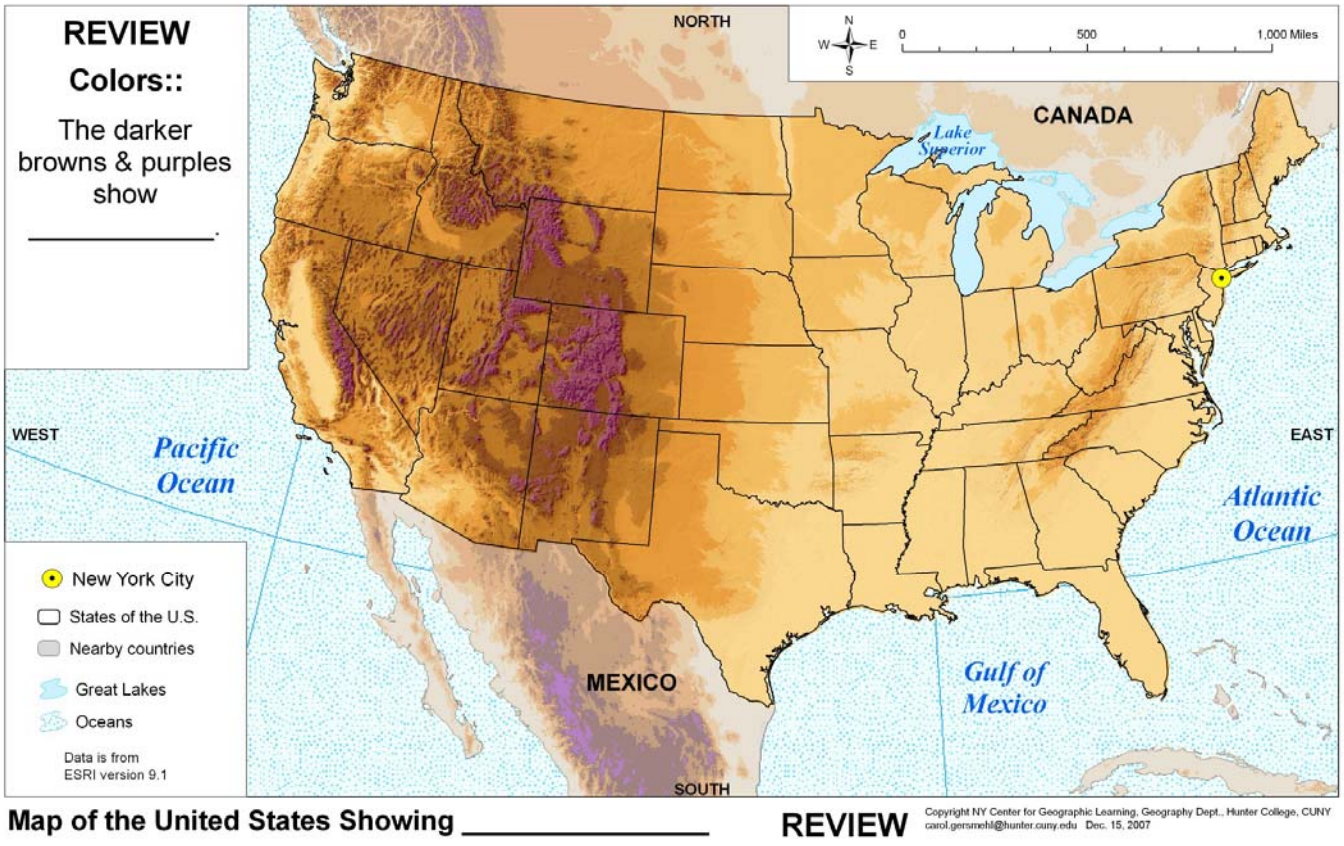
   ___ Most of the dots on that map are in the same areas as dots on this one.

   ___ The dots on these two maps are in different places.

4. What do you think these dots show? Circle one:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

5. Why do you think so?



Here is an extra map. Its title is also missing, but I am pretty sure that it shows elevation above sea level.

Compare the patterns you see on this map with the four maps of natural hazards.

1. Which of the four hazards seems to be associated with elevation (that means that the hazard occurs in places where the elevation is high)? Circle one or two:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

2. Why do you think that is so?

3. Which of the four hazards seems to be associated with land rather than water but is NOT associated with high elevation? Circle one:

   Earthquakes Hurricanes Tornadoes Volcanoes Not sure

4. Why do you think that is so?