Farming: Can You Believe It?
from the GeoInquiries™ collection for Human Geography

Target audience – Human geography
Time required – 20 minutes

Activity
Compare the rural and urban land in the United States and conduct a hot spot analysis to test the statistical significance of patterns observed.

Social Studies Standards
APHG: V.A1. Investigate the connection between agricultural practices and the alternation of the natural environment.

Learning Outcomes
- Students will explain how the distribution of people differs between rural and urban areas.
- Students will make and test generalizations as they interpret the results of a hot spot analysis.

Level 2 GeoInquiry Requirements
- A free school ArcGIS Online organization account (www.esri.com/schools).
  Instructors or students must be signed in to the account to complete this activity.
- Approximately 0.5 credits will be used per person in the completion of this activity as scripted.

Map URL: http://esriurl.com/HumanGeoInquiry10

Ask

How does distribution of urban and rural land differ?
- Click the link above to launch the map.
- In the upper-right corner, click Sign in. Use your ArcGIS Online organization account to sign in.
- With the Details button underlined, click the button, Show Contents of Map (Content).
- Click the button, Bookmarks. Select United States.
- Check the box to the left of the layer name, Percent Rural.
- Turn off all other layers.
- Hover over the layer name, Percent Rural. Click the button, Show Legend.
  What patterns do you observe? [Rural predominates; lower percent along the coasts]

Acquire

What is the relationship to land cover?
- Turn on the layer, USA Land Cover (2011).
- Pan and zoom to two or three brown areas.
  What do you observe? [Developed areas are bordered by rural areas.]
- Examine their pop-ups.
  What conclusion can you draw? [Even when the percent of rural land is higher, a higher percent of live in urban areas.]

Explore

What patterns do you see?
- Turn off the layer, USA Land Cover (2011).
- Turn on the layer, Wisconsin.
- Click the button, Bookmarks. Select Wisconsin.
  Where do you see clustering? [Rural in the North; most urban nearer Chicago]
  Where would you expect to see high rural populations? [The North and West]
- Turn off the layer, Percent Rural.
How do you conduct a hot spot analysis?

- Click the button, Analysis. Expand the group, Analyze Patterns. Choose Find Hot Spots. (ToolTip below.)
- In the Find Hot Spots tool, set the following parameters:
  1. Set to: Wisconsin
  2. Set to: POP_RURAL.
  3. For Results Layer Name, add _<your initials> to the end of the provided name.
     Ensure that Use Current Map Extent is selected and then click Show Credits.
     In the Credit Usage Report window, it should list less than 1 credit.
     Click Run Analysis.
- ? What do you observe? [Blue in the North and light red in the Southeast]
- ? Turn off the layer, Wisconsin.

Where are the statistically significant clusters of rural population?

- View the legend for the layer that you created.
  - High confidence levels indicate that the clustering is not random.
  - Set the Transparency to 55%. (See ToopTip below for help.)
- Click the button, Basemap. Select Imagery.
- ? Are the clusters of high rural populations where you predicted? [Answers will vary.]
- ? Where is the cluster of low values? Why is it there? [North; rural areas have low population density.]
- ? Where is the cluster of high values? Why is it there? [Southeast; suburbs are spreading to rural areas.]

Next Steps

Continue using an ArcGIS Online organizational account (www.esri.com/schools) to dig deeper into data using the analysis tools, and save your maps to your account.

THEN TRY THIS...

• Run a hot spot analysis using the percent of the population in rural areas. How do the results differ from the analysis conducted in this lesson?
• Add a map note for your school to this map. Create a story map that describes its location according to the Land Cover and Percent Rural layers.

TEXT REFERENCES

- The Human Mosaic by W.H. Freeman & Co. — Chapter 8
- Human Geography: People, Place, and Culture by Wiley Press — Chapter 11
- An Introduction to Human Geography by Pearson — Chapter 10