GEO STAC Student Lesson

Lesson Title: Spatial Patterns of Ancestry in US Counties   **Designer** Lynn Songer

Lesson Summary: Students will explore ancestry location in the US using 2000 Census data by county. They will explore patterns and concentrations and then explore correlations between ancestry, education attainment and economic status.

Before you begin using this module, you will need to know about using the ArcGIS Server Web-based GIS viewer. You can do this by watching the server tutorial video or working through the tutorial. The tutorial video, student activity, and Web-based GIS Tutorial Viewer can be found at http://gis.lanecc.edu. Go to the "Modules" tab and click the Tutorial link. You will need a high speed Internet connection and a current version of Adobe Flash Player.

Prior Skills: You will need to know how to turn layers on and off, use the ID, zoom in and out of the map, toggle from layers to the legend, use the identify and query tools.

Computer steps are indicated by a ▶ symbol and questions you need to answer are numbered.

A. County layers cover each other. To see a religion layer listed below another layer, you have to uncheck the upper layers and refresh the map.

B. This map shows counties but not county lines. The lines make it difficult to see the color values especially in the small counties. With a layer Active, you can choose the "I" button and click on any county to get a pop-up window with county information.

C. This is a hug file and will take a few minutes to redraw each time you select a Layer. Slow and patient clicking will make the entire experience more enjoyable.

Read the guide to understanding Census Ancestry PDF – The link to the PDF is on the lesson page and here. http://www.census.gov/prod/2004pubs/c2kbr-35.pdf   The US Ancestry map shows the results of two 2000 US Census categories. People were asked to identify their ancestry and they were asked to identify their race. The categories you see on this map are normalized to show the number of people per 1,000 of population who self-identified in specific race or ancestry categories. For example, a Native American ancestry value of 10 means that 10 out of every 1000 people self-identified as Native American in that county.]

▶ GO to Lane's GIS page. http://gis.lanecc.edu
▶ Click Modules Link.
▶ Click US Ancestry.
▶ Click the Link to the web-based GIS map.

The page will take a minute or two to load. The base map will load first then the other data will load. If it stalls at 55%, just click the **refresh** button on your browser.

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▶ Zoom in the Continental US. [icon]

Turn on Native American per 1000. This layer shows the location of people who identified themselves as Native Americans and Alaskan natives.

▶ Turn on the State border layers.

1) What three states in the continuous U.S. account for the highest Native American identity? Use the [icon] tool to click a state area → scroll across the table to read the state name.

▶ Turn on "Cajun" and turn off "Native American." Expand the layer to read the legend.

2) Describe the location of high Cajun ancestry. Is it concentrated, spread out, continuous, or discontinuous? Is it in the middle, north, west, east, or south of the country? These aspects of the location pattern describe the spatial distribution. It the occurrence of Cajun ancestry clustered (grouped) in one area or is it spread out?

3) What is the upper data range of the legend for "Cajun?" This is the percent of the population with that ancestry.

▶ Turn on "English" turn off "Cajun." It looks like English is much more prevalent than Cajun.

4) What is the upper range of the legend for English ancestry? Describe the spatial distribution of English ancestry.

▶ Turn on "Italian" turn off "English."

5) What is the upper range of the legend for Italian ancestry? Describe the spatial distribution of Italian ancestry.

▶ Select another ancestry of your choosing.

6) Describe the upper data range and then describe its spatial distribution.

▶ Look at the map for English ancestry and then for Scottish ancestry.

7) Which is more represented in the Oregon?

8) Now look at the data ranges for each. Do you still support your answer in question 7?
Why or Why not? How do the different ranges bias the visual impact of the map?

Looking for Correlations

A correlation is the relationship between two variables. Correlations can be positive or negative. For example, there is a positive correlation between city size and air pollution – the larger the city the more air pollution. There is a negative correlation between number of children in a family and the education of women – The higher a woman's education the fewer children in the family. However, it is important to remember that a correlation does not necessarily indicate cause; it is a co-occurrence. Lack of education does not cause obesity, these two variables co-occur.

You are going to explore correlations between ancestry and income.

- ▶ Turn on "Medium Income."
- ▶ Make sure none of the other ancestry layers checked.
- ▶ Turn on "County Border."

9) Describe the spatial distribution of counties with the lowest medium income, and then describe the spatial distribution of counties with the highest medium income.

- ▶ Turn off all layers except the Countries layer above Ocean.
- ▶ Right-click Medium Income
- ▶ Click Query Layer
- ▶ In the Query Builder choose Field Name = MED_INCOME
- ▶ Operator choose less than <
- ▶ Type in 30000 Choose OL – It should look like this. MED_INCOME < 30000

All the counties that meet your criteria will be highlighted in blue and shown in a data table below the map.

10) How many counties have an average income less than $30000.

To explore the relationships between low income and ethnicity you can create a two-variable query.

- ▶ Right-click Medium Income (leave it unchecked) and choose Query layer.
- ▶ Enter MED_INCOME < 30000
- ▶ Now choose And
- ▶ K_NA_AN (thousands of Native America and Alaskan Natives)
- ▶ >
- ▶ Type in 50 (50 people of NA and AN ancestry per every 1000 people)
- ▶ OK It should look like this   MED_INCOME < 30000 And K_NA_AN > 50

11) How many counties meet your criteria?

- ▶ Turn on Native American per 1000.

12) Is there a positive, a negative, or no correlations between ancestry and a specific income range?

13) Repeat this method to look for correlations using two other ancestries and report your findings.

14) Discuss the correlations you were asked to explore. This study shows variable that might co-occur. Discuss other variables you would need to explore (in this data set or other types of data you would want) to understand some of the causes of low education attainment or low economic status.

Career Extension

- ▶ Go to the website: http://www.esri.com/industries.html
- ▶ Find a career that might be of interest to you. For example, in the Natural Resources list there is a link to Forestry. In the forestry link there are several job descriptions in the Industry Focus.
- ▶ Prepare a half-page summary of the types of things that someone would do in this career using GIS.
- ▶ Search the Internet and look for job possibilities, salary, and locations.