Cogstone Research Summary

June 12, 2021

My research essentially aims to answer the question that anthropologists have endlessly pondered: What drives cultural diversity?

Studying the mechanisms of cultural diversity is of broad interest across many disciplines, and archaeology has the potential to inform us on how societies fostered or failed to foster diversity in the past. However, a major challenge has lied in "seeing" diversity in the past as compiled in a dataset.

For this research, I have used GIS to create a dataset that would allow me to "see" cultural diversity. I compiled geographic data of North American projectile point types from Noel D. Justice's three reference books and digitized the data using QGIS (version 3.10, A Coruña) (see Figure A). Projectile points are sharp stone tools hafted onto wooden shafts of technologies such as the atlatl or bow and arrow, serving its function by piercing hunting game. The existence of a projectile point type reflects culture, and therefore projectile point type diversity can be considered a proxy for cultural diversity. A projectile point type distribution refers to the area that a particular type of projectile point is found in (see Figure D).

In the beginning of my research, I observed that geographic data of projectile point type distributions across the United States indicated three "hubs" of projectile point types in the United States: near California's Bay Area, the Southwestern United States, and the Southern Great Lakes regions (Figure A). Why did these "hubs" of cultural diversity exist?
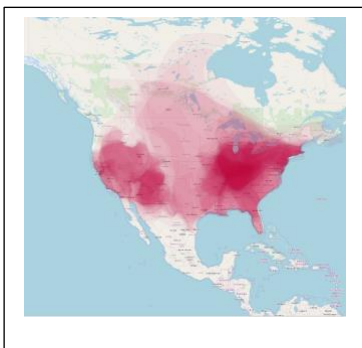

Figure A. Original version of projectile point type distributions made on QGIS. Depicts the three "hubs" of projectile point type diversity.
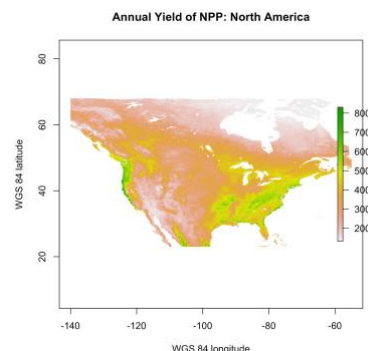

Figure B. Compilation of seasonal NPP data collected from NASA Earth Observation Dataset. Created in R statistical software.

I believe that many factors can affect cultural diversity, some of which are easier to examine than others. My goal in this research is to specifically explore the effects of the environment, not necessarily because I think it is the most important factor, but because it is one potential factor that I can evaluate with available data. I formed a biodiversity dataset using 2015 North American monthly NPP data from the NASA Earth Observation Dataset and combined four seasonalities of NPP to create an average productivity dataset (see Figure B).

My research compares the value of NPP to the value of projectile point type diversity across the United States in order to determine any relationship between the two variables. The result of this research will allow us to determine whether or not, and to what extent the environment drives cultural diversity.