Settlement Patterns in Pre-Colombian Oaxaca Valley

Aria Kluczewicz (Geography 592)

RESEARCH QUESTION: What environmental (or other) factors affected where ancient people settled in Oaxaca Valley, Mexico?

PREDICTIONS:
1. Close to water
2. Lower slope areas
3. Higher land quality
4. In view of city centers?

DATA SETS:
• Hand digitized maps (Feinman) → settlement polygons & rivers
• 30m DEM (ASTER)

ANALYSIS (viewsheds):
Monte Alban, one of the major cities of Oaxaca, was built on top of a natural mountain top that was further flattened to allow for a complex city and temple to be constructed. Placing cities on "the high ground" is nothing new, as it provides a lookout point for defensive or offensive purposes, and to keep an eye on the surrounding land.

I was interested in looking at whether ancient settlers might have chosen to live in locations where Monte Alban would be visible to them, especially during the height of its power (MA IIIB). The left map shows a viewshed of Monte Alban, created using 28 points dispersed around the city. I chose primarily tops of large buildings and pyramids, as these would have been the most visible. Finding heights for these buildings is difficult, despite their well preserved state, so I gave them a blanket 20m height (a very conservative value; the Great Pyramid of Giza is about 139m). I also set the observed cells to an offset of 1.5m, the average height of a man.

As you can see in the graph (bottom left corner), visibility slowly decreased until during MA IIIB it suddenly spiked, before quickly dropping again. Given Monte Alban's prominence during this time, it would make sense that people should try to settle in view of their rulers (whether voluntarily or not is impossible to tell). During MA IV, when the visibility drastically decreases, Monte Alban had significantly decreased in power, and the city of Jalieza had risen to take its place.

CONCLUSIONS: While it is easy to assume that environmental factors such as distance from water, land cover quality and slope would be the main factors that determined where ancient people settled, that is clearly not the entire case. I explored viewsheds as one possible alternative, but there are many other possible factors as well: proximity to trade or religious centers, warfare and defense, etc. While we can never definitively know why people acted the way they did in the past, using GIS helps paint a clearer picture of what could have happened.