

Plants and Neighborhoods

CAP LTER Data Explorations



Author: Ecology Explorers Team, adapted from Martin et al. 2004. Neighborhood socioeconomic status is a useful predictor of perennial landscape vegetation in residential neighborhoods and embedded small parks of Phoenix, AZ. *Landscape and Urban Planning* 69:355-368

Time: 15-30 minutes

Grade Level: 9-12

Background:

The Phoenix urban core is composed of several contiguous cities and is situated within the Sonoran Desert. This area is being studied by scientists as part of the long-term ecological research network (LTER) funded by the National Science Foundation. Our project, the Central Arizona-Phoenix LTER (CAP LTER) is focusing on researching the effects of urbanization on the surrounding desert ecosystem and vice versa. The Phoenix area is growing rapidly with a population of 300,000 people in 1950 and 3 million+ in 2005. The area receives annual precipitation of 180 mm (6 inches) and can experience summer temperatures as high as 48 C (115 F). The rain comes twice a year (winter & summer), which contributes to the high species diversity of the Sonoran Desert as compared to the North American deserts. Urbanization of this area has led to decreased agricultural development (formerly focused to the west, south, and southeast of the urban core) and increased water control via dams, reservoirs, and canals.

Objective:

Students will analyze data related to neighborhood landscaping and socioeconomic status.

Standards:

Science

Advanced Preparation:

Students should have an understanding of different land-use types in the Phoenix area. Students should understand that people living in different neighborhoods in the Phoenix area have different incomes. Students should have some familiarity with data analysis using correlations.

Materials:

Student Worksheets

Evaluation:

Observation during the activity and participation in discussion.
Student responses to reflection questions.

Extensions:

Have students investigate the landscaping in their neighborhood (<http://caplter.asu.edu/explorers>).

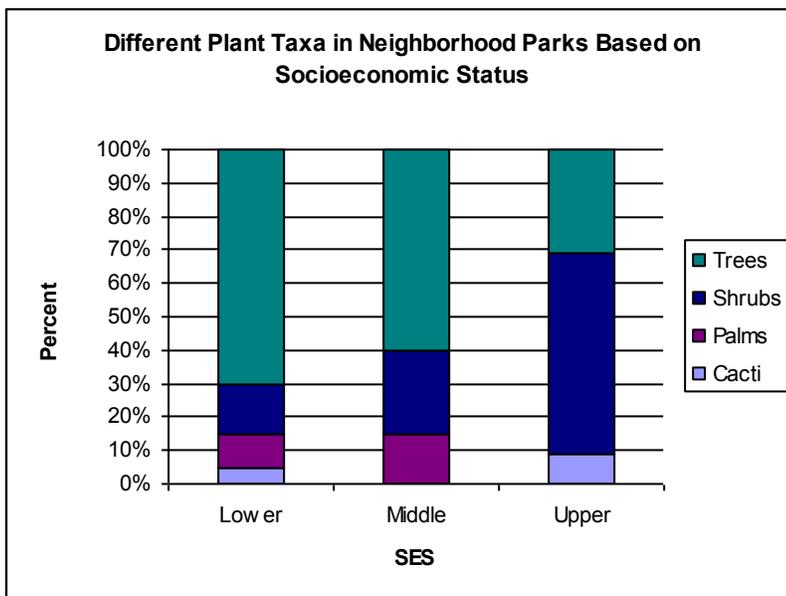
Student Worksheet

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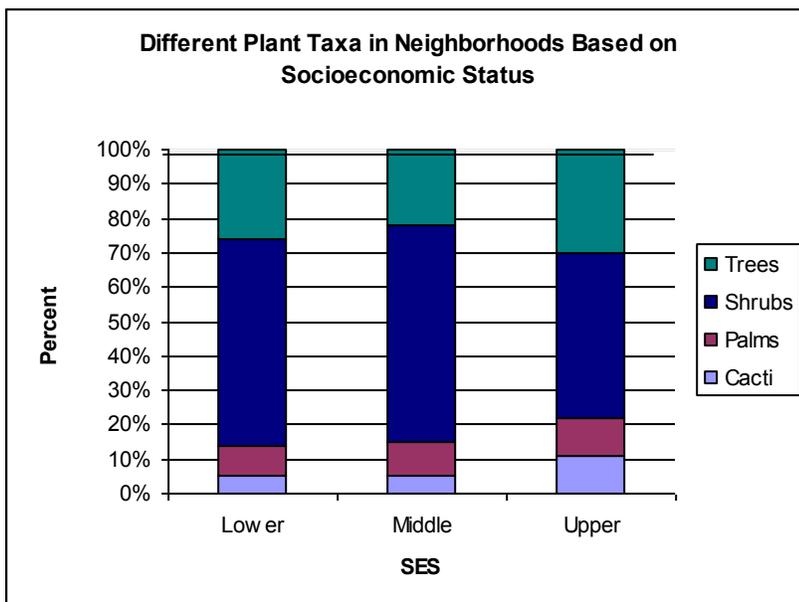
CAP LTER is identifying and researching connections between human behavior and ecology. These graphs are from this type of research and suggest possible interactions between people and vegetation patterns. No cause for these correlations has been identified. Identifying correlations can be critical to the advancement of science. If a species of butterfly is found more frequently next to ponds (is positively correlated with ponds) and less frequently with streams (is negatively correlated with streams) this leads to plausible hypothesis and testable experiments. For example, one could hypothesize increased butterfly frequencies occur at ponds because the plants butterflies prefer need still as opposed to moving water. From this an experiment can be designed leading us to a better understanding of both plants and butterflies. Use these graphs to identify correlations between people and the habitats they create (plant vegetation patterns).

Graph 1



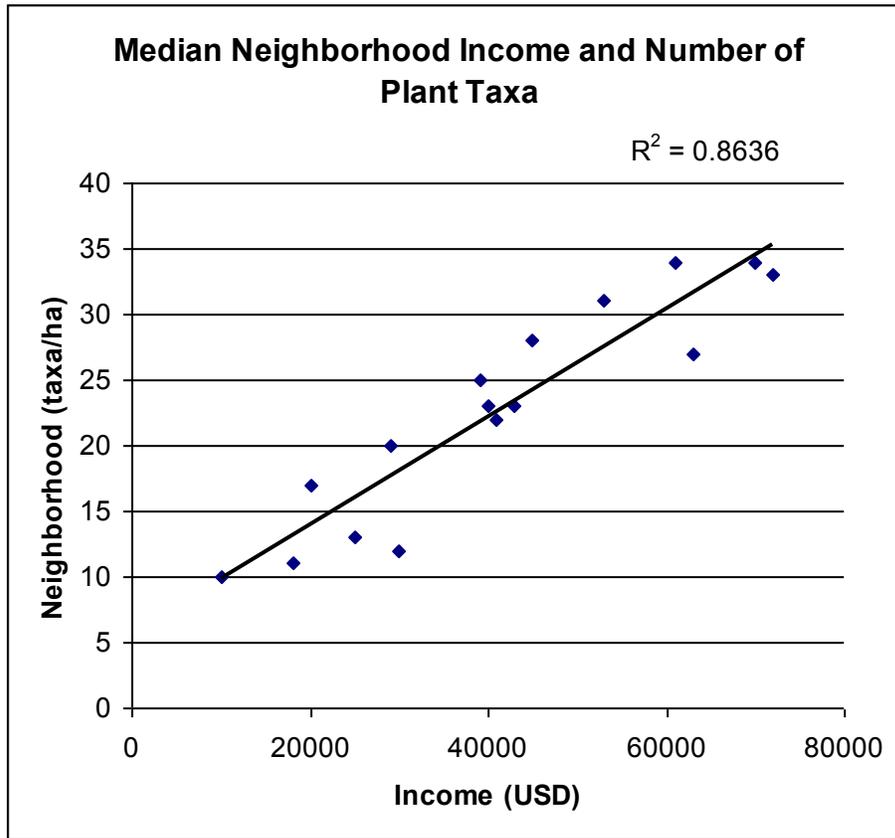
Socioeconomic status (SES) is based on income and social status associated with different amounts of income. Families with higher income are able to spend their money on more things than just the basic necessities (food, shelter, etc).

Graph 2

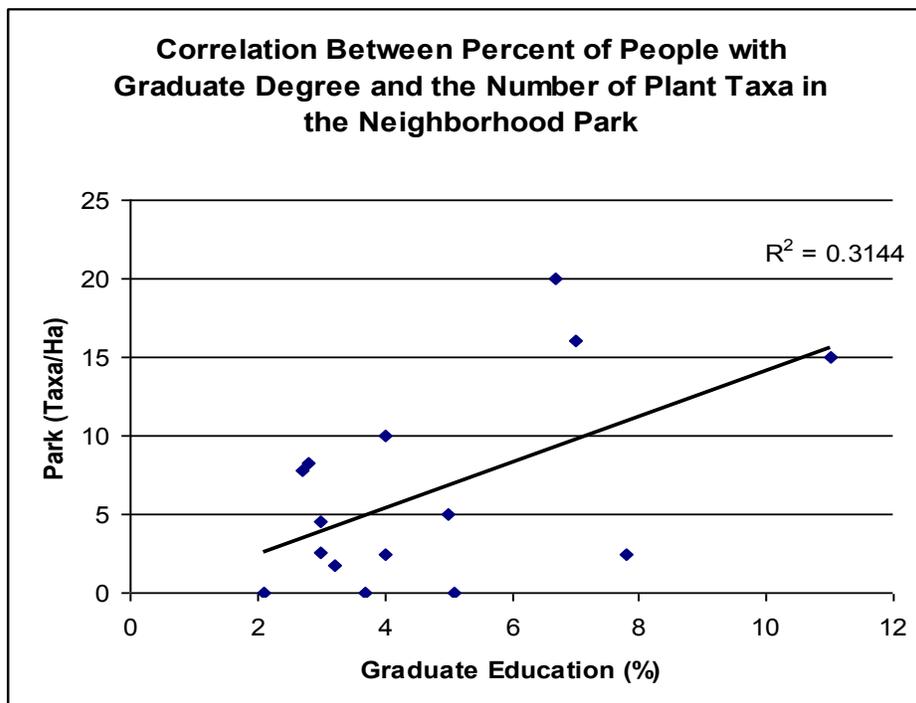




Graph 3



Graph 4



Student Worksheet

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1. In Graph 1, describe the major differences between the parks in the upper socioeconomic areas as compared to the lower and middle income areas.
2. For Graph 2, describe any difference you find among the plants in the different neighborhoods.
3. Why do you think the trends exist in Graphs 1 and 2?
4. Describe the correlation between income and plant taxa in Graph 3. Is this a positive or negative correlation?
5. Graph 4 shows a correlation between graduate degree and plant taxa. How does this graph relate to Graph 3?
6. Graphs 3 & 4 show correlations between two items. What hypothesis could you develop from this information? How would you test the hypothesis?