CAP LTER Data Explorations
Plants and Neighborhoods

Objective(s):
Students will analyze data related to neighborhood landscaping and socioeconomic status.

Author:
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Time:
15-30 minutes

Grade Level:
9-12

Standards:
Science

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 with 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 other 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.

Looking for patterns in nature is one of the first steps to developing testable hypotheses. For example, 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 hypotheses and testable experiments. For example, one could hypothesize increased butterfly frequencies occur at ponds because the plants butterflies feed on live near ponds and not streams. From this an experiment can be designed leading us to a better understanding of both plants and butterflies. In CAP LTER, scientist have found correlations between people and their landscaping choices, which in turn may affect things like bird abundance.

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

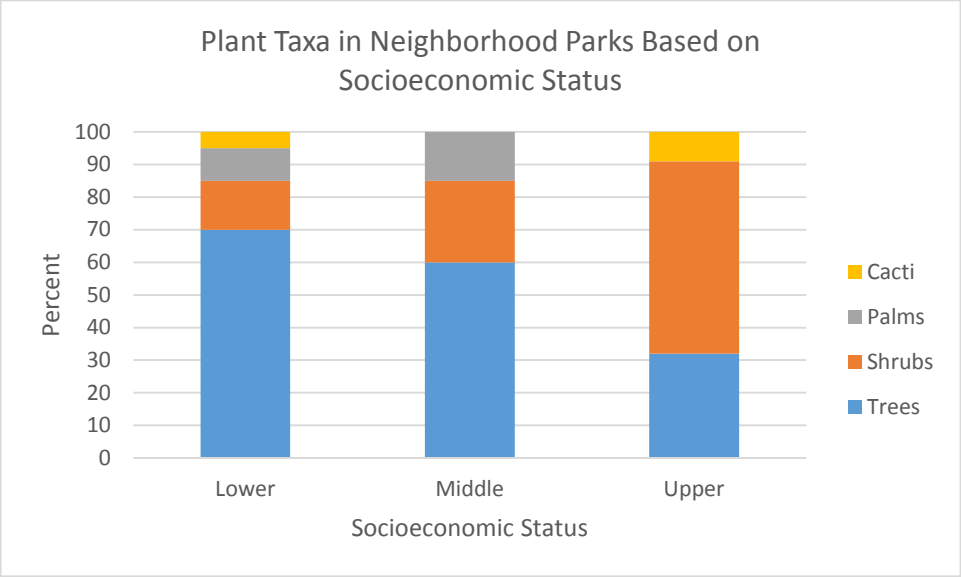
Evaluation:
- Observation during the activity and participation in discussion
- Student responses to reflection questions

Extensions:
Have students investigate the landscaping in their neighborhood (http://ecologyexplorers.asu.edu)

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

Student Worksheet (page 1)
Plants and Neighborhoods

CAP LTER is identifying and researching connections between human behavior and ecology. These graphs suggest possible interactions between people and neighborhood plants. No cause for these correlations has been identified, but identifying correlations can be critical to asking/developing appropriate and testable questions.. Use these graphs to identify correlations between people and the habitats they create in their backyards and parks.



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