

# Urban Ecology at the Central Arizona-Phoenix Long Term Ecological Research Site

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## Abstract

The Central Arizona-Phoenix (CAP) LTER is a long-term study of central Arizona and metropolitan Phoenix, a 6,400-km<sup>2</sup> region of desert, agricultural, and urban/suburban lands that is experiencing rapid urbanization and population increase. The guiding CAP research question is:

*How do the patterns and processes of urbanization alter the ecological conditions of the city and its surrounding environment, and how do ecological consequences of these developments feed back to the social system to generate future changes?*

CAP relies on research strategies that include data mining, long-term monitoring, experiments, modeling, and comparative ecology. In this talk, I will describe results from each research approach.

Mining of historical aerial photographs and county agency records have been used to map historical land use and land cover in the Phoenix area. Long-term climate records have been evaluated to determine the magnitude of the heat island created by the city. CAP has established a 200-point spatial survey that is the cornerstone of their long-term monitoring efforts. Variables measured every five years in this Survey200 scheme include major physical, biotic, biogeochemical and human characteristics. Standing biomass, ground arthropods, and bird surveys are done more frequently at a subset of the Survey200 sites. A nitrogen budget has been created for the study area based on atmospheric deposition monitoring data. CAP has also initiated a neighborhood scale experiment to evaluate the effects of four landscaping styles on ecological and social phenomena, including biogeochemical processing, water consumption, avian and insect communities, and quality of life.