Introduction:
CAP LTER has conducted a long term survey of ground-dwelling arthropod communities inhabiting different types of land-use areas throughout the greater Phoenix metropolitan area. We investigated temporal and drought influences on arthropod pitfall traps surveyed from 2002-2014 across desert, agriculture, mesic urban, mesic/xeric mixed urban, and xeric urban areas.

Methods:
Ground-dwelling arthropods were collected using 10 dry pitfall traps at each of the 47 sites. Trap were spaced 5 m apart along a line transect. Organisms are identified to the lowest taxonomic resolution possible.

Analysis Methods:
Effects of land use and time Abundance and species richness were explored using General Linear Mixed Models (GLMMs). Land use effect magnitudes (Cohen’s d) were calculated using the results of a priori contrasts.

Results:
GLMMs showed significant main effects of land-use and survey, and a significant land-use X survey interaction, for abundance and richness (all effects p < 0.005).

Figure 1A. Ground-dwelling arthropod abundance for each land-use type over time. Dashed lines denote significant of a priori planned contrast between land use types.

- Abundance in Agriculture and Desert land use types were significantly less than mesic and xeric land use types.
- Abundance in residential land-use types with turf grass was significantly greater than those with xeric landscaping in quarter 4 of 2013.

Figure 1B. Ground-dwelling arthropod species richness for each land-use type over time.

- Richness in the agriculture land use was lower than mesic and mesic/xeric mixed land use type.

Table 1. Best performing GLMMs predicting land-use effect size on ground-dwelling arthropod abundance and richness for each survey, Cohen’s d, \( \Delta \), difference from the lowest AICc value from the set of candidate models; \( \omega \), Akaike weight, PDSI, Palmer Drought Severity Index; Q, quarter. Marginal R\(^2\) (proportion of variance explained by fixed-effects only) for each model and B estimates (in parentheses) for the independent variable(s) are given.

Conclusion:
Drought had strong effects on arthropod abundance in desert land uses, but weaker effects on abundance in agriculture and urban land uses. Arthropod richness variation was explained and positively influenced in mesic models in which current and prior PDSI values were present. PDSI and temporal influences did not fully explain the significant variations in land use effect magnitude. This suggests some other factor may also be responsible. Future work on this project will be to investigate the long-term effects of land use on beta diversity patterns and community structure of arthropod communities.