Background

- Increasing our knowledge of the effects of urbanization on plant communities is fundamental to understanding the value of urban ecosystems in providing vital services to residents, such as clean air and mitigation of the urban heat island effect.
- Our research builds on the findings of previous land use and plant diversity research at CAP LTER (Hope et al. 2003, 2006, Walker et al. 2009) and aims to improve our understanding of the interactions of human activities and the environment by examining variability in plant community patterns across time and landcover types.

Methods

- **Sampling methods cont.** – Then finer-scale within-urban residential land-use categories were used to define residential landscapes as mesic, xeric, or oasis.
  - Mesic plots primarily consisted of extensive irrigated lawn, high water-use plants, and lacked gravel swaths.
  - Xeric plots typically consisted of drip-irrigated desert-adapted plants, usually covered in gravel mulch, and lacked irrigated lawn.
  - Oasis plots consisted of a combination of xeric and mesic components; such as high and low water plants and some lawn.

Methods cont.

- **Analysis methods –** To compare 2010 Survey 200 spatial patterns to those observed in 2005, we duplicated several of the analyses conducted by Walker et al. (2009), specifically non-metric multi-dimensional scaling (NMDS), and plant species richness, by land-use type at coarse and fine scales.

Results

- **Course-Scale Analysis –** As found for 2005 (Fig 7b), we found that plant species richness varied among landscape aesthetic land-use types (Fig 7a). 2010 plant species richness increased from mesic to oasis to xeric, though the differences were not statistically significant. Walker and colleagues partitioned native and non-native species for this analysis and we did not, so this may account for the lack of significance in 2010.
- In contrast to the course-scale regional land-use of 2010 (Fig 5a) and to the 2005 residential land-use analysis (Fig 8b), ordination of the 2010 plant species does not reveal distinct plant communities at the residential level (Fig 8a).

Preliminary Conclusions

- These aberrations in community composition between 2005 and 2010 suggest a shift in social-ecological processes driving plant community patterns. Future work includes refined comparisons of 2005-2010 data and investigation into drivers of this change between survey years.
- We expect the drivers of this shift to be related to the 2008 housing and economic crisis, which had a particularly severe impact on the growing economy of Phoenix metropolitan area. However, thus far the differences found are not great, and there may not have been sufficient time for the socioeconomic factors to affect urban vegetation.

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