Application of integrated inventory to the study of urban ecosystem: an extensive 200-site field survey of the Central Arizona-Phoenix LTER

D. Hope1, C. Gries1, W. Zhu3, S. Carroll2, L. Stabler4, A. Nelson1, C. L. Redman1, N. B. Grimm2, A. Kinzig2, and S. Paine1

1Arizona State University, Center for Environmental Studies. 2Arizona State University, Dept. of Biology. 3Biological Sciences, SUNY Binghamton. 4Arizona State University, Dept. of Plant Biology.

Introduction & Methodology

- What are the ecological conditions associated with the range of current land uses across metropolitan Phoenix and how do these conditions vary in space and with time?

To answer this question we adopted a whole system approach, using a random sampling design to conduct an extensive field survey and integrated inventory of a number of key variables.

- A tessellation-stratified sampling design consisting of a 4km x 4 km grid was overlaid on the developed urban core; outside this area every third grid cell was sampled (n=206 sites).
- Field plots were 30m x 30m square and were surveyed exactly where they fell – unless access was not possible (12 such cases) when they were moved to the nearest available point with same characteristics (possible at all but 2 sites), giving a total sample of 204 sites.

Main variables inventoried:

- Land use & surface cover types (e.g., grass, concrete, asphalt, bare soil, tile roof)
- Vegetation diversity (at to genera), biovolume & condition (see Stiles & Schenker poster)
- Soil: Soil cores for determination of major nutrient contents, pH, bulk density & moisture
- Soil fauna/flora: Samples taken for assay of prokaryote, mycorrhizal activity/diversity (see the Cousins & Stutz poster) & pollen
- Micro-massometry: measured while on site
- Decomposition study (place Encelia farinosa litter bags & wood for recovery after 12 months)
- Insect diversity: 3 sweep net samples taken from representative shrubs & trees on the plot (see the Range et al poster)
- Vegetation measures will include:
  - cover of major vegetation types
  - biovolume
  - race/ethnicity- household type indicators
  - socio-economic index (see map)

Development of an ‘urban-ness’ index

The proposed method uses a number of key components as equal contributors to the index. Another possibility is to create sub-indices that are constructs of the index. Another possibility is to create sub-indices that are constructs of the index. Another possibility is to create sub-indices that are constructs of the index.

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