Perennial Plant Species Richness, Diversity and Plant-Preferences in Phoenix – A Spatial Model For Prediction

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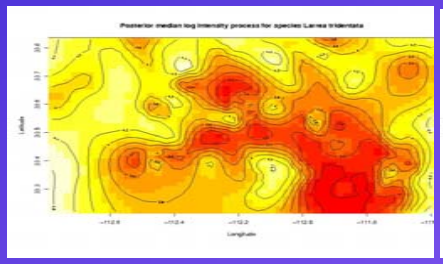
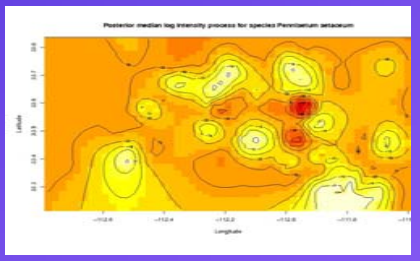
Dependent variables: Perennial Plant Species counts, for 38 species, for 144 spatial locations.

Independent variables significant in our model: For every location, ever in agriculture(0-1), elevation, income.

Challenges met in our model: Multivariate Spatial count data; Non-Gaussian model; Spatial GLMM used; Spatial heterogeneity due to different land-use; Nonstationarity; Dimensionality(5472 data points), Model comparison; Prediction of Diversity, Richness, Intensity of species; Prediction(Plant Preference).

Statistical Modeling: A Non-stationary Spatial Generalized Linear Mixed Model (SGLMM) was used.

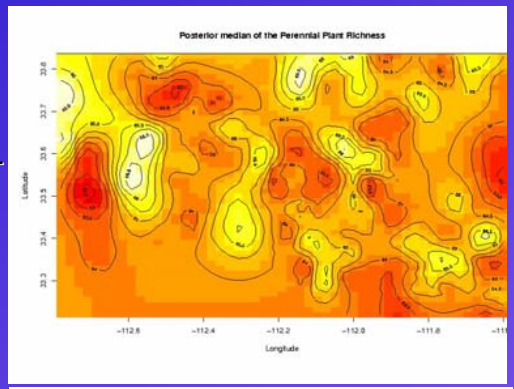




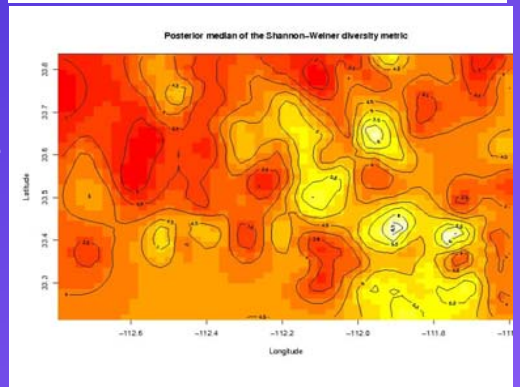
Based on the model we generated spatial intensities of Larrea Tridentata(Left image) and Pennisetum setaceum (Right image)

**LIGHTER is HIGHER.

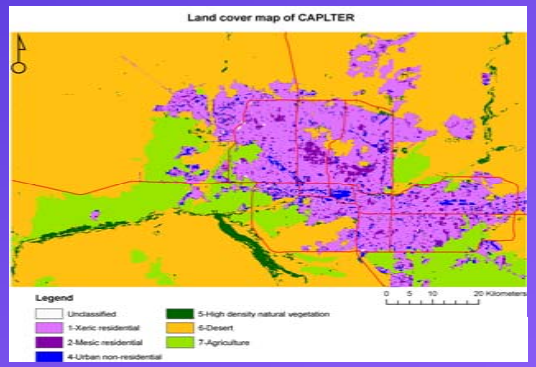
Predicted Richness of Perennial Species



Predicted Shannon-Weiner Diversity



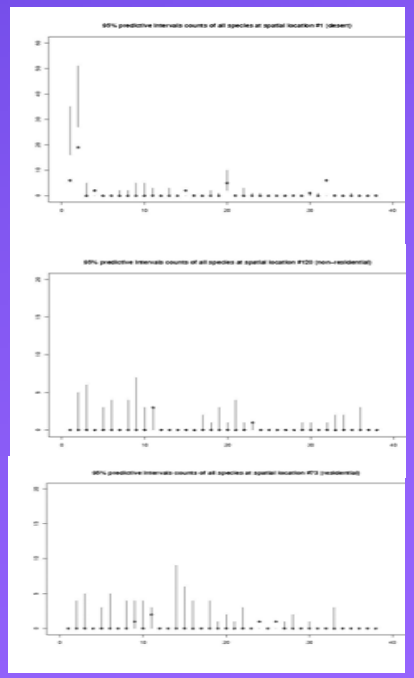
Land-use map of Phoenix 2000



Landuse types: Urban residential, Urban non-residential, Desert.

Data:
144 spatial locations. 38 Species.

95 % prediction intervals for each of 38 species at 3 distinct locations: Desert(top), Non-Residential(mid), Residential(bottom). Actual count is marked as a circle.



The regression coeffs. fer each of 38 species for Ever in ag. For Desert points(top), Non-residential points(middle) Residential points(bottom)