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Uncertainty in Mapping: Water Education Effort

Many organizations provide public outreach yet evaluation rarely considers interactions between organizations. Issue perception and engagement with knowledge may be partially explained by the way outreach sources provide access to programs. For environmental issues like water, understanding the differences in outreach availability across neighborhoods may reveal systemic patterns in under service that contribute to recognition, procedural, and outcome injustice. Receiving lower education effort could decrease public participation in decision making across a variety of scales. The diversity of outreach program structures means that researchers must pay careful attention to the methods they use to categorize program reach. From June to October, 2006 I collected program information using interviews and existing evaluation documents for 43 organizations. Here, I compare the results of spatial analysis using points, buffered points, and area-counts to represent education programs. While some general patterns hold across analysis methods, there are differences in the areas defined by each method. The analysis from this study will be used to look for patterns in education provision across demographic variables. Future research will determine the relative role of geographic and population-based discrepancies in access to outreach.



Uncertainty in Mapping: Water Education Effort

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1. Water education programs have overlapping audiences

Access to water education may influence household conservation and decisions at larger scales. Determining the distribution of educator effort is a first step in understanding one component of accessibility: distribution. Examining distribution can allow inquiry into factors that may limit another component of accessibility: salience.

- 49 groups provide education
- 29 participated in interviews
- Website information supplemented interviews
- Used Geographical Information Systems to plot and compare three representations of effort

I look at the landscape of educator effort created by the overlapping program boundaries. I aim to:

- A. Explore methods for representing program distribution
- B. Examine the stability of patterns across representations

2. Representations: Zip Code, Census Tract, Travel Distance

- Counted programs by zip code, census tract. Travel distance calculated by creating point buffers around education sites based on the distance between similar points. This is added to mail, rebate, and other disperse education.
- Grouped (in 3 quantiles) to label areas High, Medium, Low education effort.

Acknowledgments
 This material is based upon work supported by the National Science Foundation under Grant No. SES-0345945 Decision Center for a Desert City (DCDC). Any opinions, findings and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF). Thanks to Nicholas Moore for his work geocoding, Dr. Ann Kinzig and the Kinzig Lab for critical feedback, participating water educators.

3. Representations: Program intensity as an alternative to simple counts

Are all education programs created equal?

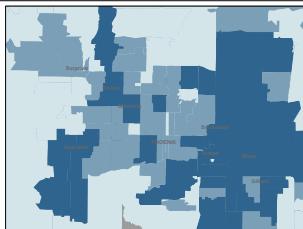
Example: The benefit of a course on xeriscape is different than that of a bill insert. Calculated expense per program per capita as common measure of "intensity" and represented using same three methods outlined previously.

4. Patterns: Educator effort is patchy in all representations

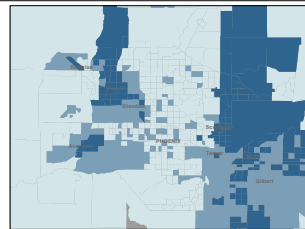
Results of the Moran's I test for spatial autocorrelation were highly significant (Moran's I 0.06-0.13, Z-score 6.59 – 53.14, p<<0.01) for all representations of education effort.

Total Program Count
Intensity (\$ per capita)

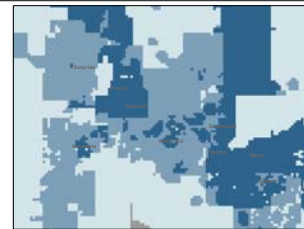
A. Zip Code



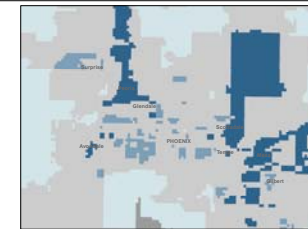
B. Census Tract



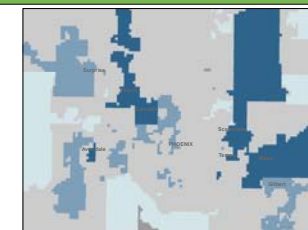
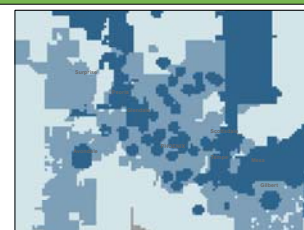
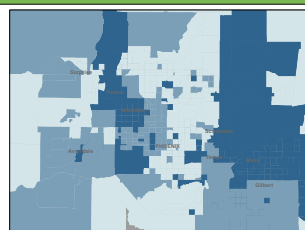
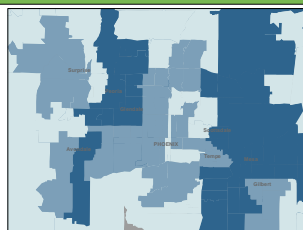
C. Travel Distance



Stable Across A B C



General patterns of education hold across maps: Education is patchy. Some areas in the metropolitan areas maintain a consistent classification as High, Medium, or Low when comparing representations to each other.



Expense information accounting for production costs offers a different picture of program effort intensity. Education effort remains patchy. Metropolitan areas maintaining stable rankings occur the same regions with count and intensity based representations.

Education Types Identified by Organizations	
•School Programs	•Newspaper
•Teacher Training	•Radio
•Demonstrations and Exhibits	•Television
•Landscaping Courses	•Direct Mail
•Neighborhood Canvassing	•Rebates
•Booths at Community Events	•Information Kiosks



5. Future research about public awareness should target neighborhoods with stable representations

Future Work:

Does the type of information provided across various "high" education zones vary in its provider, content, and format diversity?

Are there systematic differences in information availability created by the interaction of educators?

Does more education mean better access?

-Use maps to choose areas for participation in a survey of public preferences and awareness of water education. This will help determine if there are barriers to information accessibility are geographically based, and/or due to topic and medium