Session 5

Application of Cartograms in Measuring Sprawl

Discussant: Xiongjiu Liao

Background of study

Urban Sprawl should be counted as one of the topics with the longest popularity. Since it caught people's attentions in 1950s, it has not really left the newspaper, journals, or tv's headlines. Most of the discussions are disputes of the pros and cons about urban sprawl. Some like it, however many more people hate it. The critiques for sprawling include: encroach the agriculture lands and open spaces, increase the infrastructure cost, separate social groups, cause downtown in ellipse, etc. The arguments from the sprawl supporters include: provide people American Dream (suburban house), increase suburban land value and taxations, access to the greens, etc. Different understandings are given to "sprawl" as needed. If there exists a best word to describe these discussions and studies about urban sprawl, it should be "mess".

Existing study strategy

Researches noticed that to make the discussion meaningful, a clear definition and measurement are needed. A classic paper in this field was written by George Galster et al. in 2001: "Wrestling Sprawl to the ground: Defining and Measuring and Elusive Concept". They regarded urban sprawl as an inefficient land use pattern. This recognition is being accepted by more and more researchers. According to the definition, Galster et al.'s proposed to measure sprawl by measuring 8 indexes: measuring proximity, density, continuity, concentration, clustering, centrality, nuclearity, mix uses, of land use patterns.

Critique of Existing study strategy

Land use patterns contain not only developed lands (by human activities), but also undeveloped lands, such as mountains, lakes, rivers, deserts. Thus using Galster et al.'s method, we are measuring a composite of natural landscapes and human developments. As we normally regard urban sprawl as the results from human activities, Galster et al.'s measuring will not capture the real features of urban sprawl.

Proposed solution

We propose to measure sprawl by measuring the spatial features of land use patterns whose landscape differences are controlled. That is to say, we will measure the features of human development activities, instead of the natural environment. The technique used

to accomplish this task is Cartogram. Using Cartogram we can maintain some features of map data by transforming it. After equalizing all the places' construction cost, the land use map contains only the differences of human developments. The spatial measurements based on this kind of cartogram-processed data will provide us a more realistic image of urban sprawl.

Please read the articles below and consider the following questions to discuss on Tuesday.

Discussion questions:

1. What are the main differences between Galster et al.'s sprawl definition and the previous definitions? What are your ideals about how to define urban sprawl?
2. What is Galster et al.'s sprawl measurement strategy? How do you think of it? Do you have any new ideas about how to measure sprawl?
3. What is Cartogram? What are its major applications? How to produce a cartogram for an existing map data?
4. What are the advantages and disadvantages to use cartogram-processed data for sprawl measuring?
