The Evolution of Community Development in the United States

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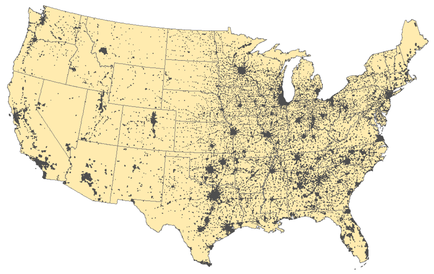
The Birth, Location, and Growth of Communities

Urban areas are loci of population and production.

- In 2010, 80.7% of the United States population resided in urban areas (Census Bureau).
- In 2011, 90.1% of GDP was produced in metropolitan statistical areas (BEA).

These communities are centers of commerce that help provide goods and services to those living in rural areas.

Incorporated Places in the United States, 2010



Existing work on the growth and location of communities analyzes one aspect of community growth at a time, either the location, growth, or birth of settlements, despite the role all three play in the evolution of urban systems.

Objective: Use the three descriptive aspects of settlements to tell a comprehensive story that addresses when communities were created, where communities are located, and how communities grow in the United States.

Note: This version of the poster focuses on the first of these three aspects, when communities form.

What Affects When Communities Form

The literature suggests a combination of 1st (endowed) and 2nd (created) nature geographic locational properties that influence settlement formation.

Year of Incorporation

Accessibility

- Distance to rivers
  - Bosker and Buringh (2011), Motamed, et al. (2014)
- Distance to oceans
  - Motamed, et al. (2014)

Geography

- Temperature
  - Motamed, et al. (2014)
- Topography
  - Motamed, et al. (2014), Bosker and Buringh (2011)
- Cultivation suitability
  - Motamed, et al. (2014), Bosker and Buringh (2011)
- Longitude
  - Geisen and Suedekum (2013), Dobkins and Ioannides (2001)

Proximity

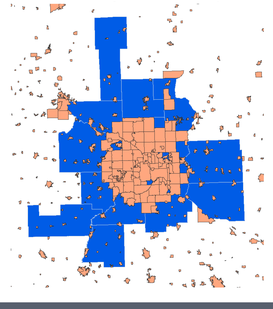
- Distance to nearest community
  - Bosker and Buringh (2011)
- Adjacent communities
  - Dobkins and Ioannides (2001)
- Size of nearby communities
  - Dobkins and Ioannides (2001)

Why Incorporated Places?

Advantages:

- A conscious decision that provides an objective definition of when settlements begin that is part of public record.
- Smaller than (most) counties and (all) MSAs, providing more accurate and detailed results.
- A geographical unit that has been collected in the decennial census for almost 200 years.
- No minimum population threshold — includes both large and small communities in the analysis.
- Directly addresses the research focus of how first and second nature geographic forces influence differing aspects of settlements (rather than economically-based MSAs or CCA clusters.)

Comparison of Minneapolis-St. Paul MSA and Incorporated Places, 2010



Incorporated Place Data

Incorporated Place: "A type of governmental unit established to provide governmental services for a concentration of people within legally prescribed boundaries, incorporated under state law as a city, town, borough, village or other description" (US Census Bureau, 2008).

Unit of Analysis: 2010 incorporated places

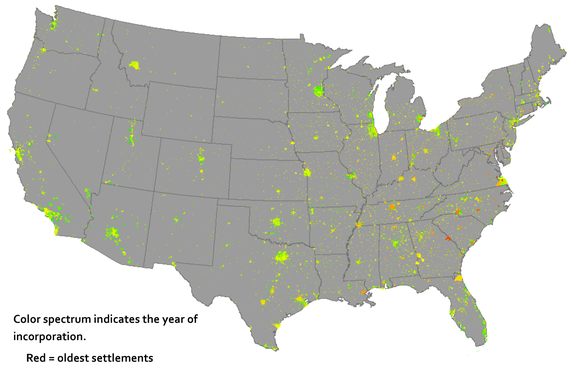
Geographic Extent: 48 contiguous US states and Washington, DC

Number of Observations: 19,392

Data Sources:

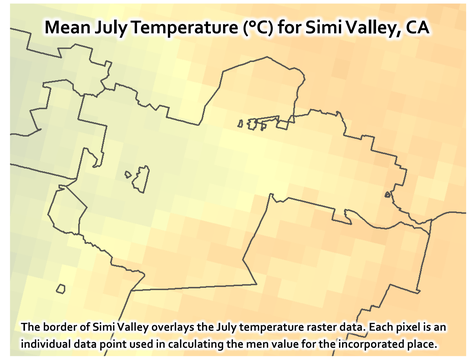
- *Incorporation Date:* gathered from state and county governments, state municipal leagues, city governments, and the decennial census.
- *Population:* 1790-2010 decennial censuses, Census Bureau
- *Temperature:* PRISM Climate Group
- *Land Surface Forms:* USGS Land Change Science Program
- *Elevation:* GLOBE Project
- *Rivers:* NHDPlus
- *Oceans and Great Lakes:* Commission for Environmental Cooperation (CEC)
- *Longitude:* incorporated place shapefile, Census Bureau

Year of Incorporation for 2010 Incorporated Places



Color spectrum indicates the year of incorporation.
Red = oldest settlements
Green = youngest settlements

Mean July Temperature (°C) for Simi Valley, CA



The border of Simi Valley overlays the July temperature raster data. Each pixel is an individual data point used in calculating the men value for the incorporated place.

Non-Census variables were calculated using ArcGIS.

Grid Cell Data: Geography variables were calculated from raster data by calculating the average or majority value of all data points within the boundaries of each incorporated place.

Distance Data: Accessibility and Proximity variables were calculated as the Euclidean distance from the center of each incorporated place to the nearest feature of interest (e.g., river).

Analysis and Conclusions

Research Question:

What 1st and 2nd nature geographic factors influence when communities form?

Model: Inspired by Motamed, et al. (2014), is the log-linearized version of:

$$Age = \alpha + Accessibility\beta + Geography\delta + Proximity\theta + \varepsilon$$

Dependent Variable: Age = 2010 - IncorporationYear

Estimation Process: OLS is our base model, but due to heteroskedasticity a Poisson model was used, following Santos Silva and Tenreyro (2006). Due to overdispersion in the data, the zero-truncated negative binomial specification is our preferred model.

Conclusions:

- Settlements in the Eastern US were incorporated much earlier than Western communities.
- Communities that are mainly located on flat plains incorporated earliest, while settlements mainly located on high mountains incorporated latest. No settlements incorporated on land that was predominantly low hills.
- On average, the youngest settlements are located where July mean temperatures are higher.
- Communities closer to navigable rivers incorporated earlier than those further from rivers. The unexpected result that settlements nearer the Great Lakes and oceans incorporated later may be resolved when proximity variables are added to the regression.

Marginal Effects of Factors Influencing When IncPl Form

	OLS	*Zero-Truncated Poisson*	*Zero-Truncated Negative Binomial*
Dependent variable:	*ln age*	*age*	*age*
ln distance to Great Lakes	5.463	4.387	4.515
ln distance to ocean	8.189	7.261	7.229
ln distance to navigable river	-5.545	-5.138	-5.146
ln longitude	-158.071	-144.468	-142.906
ln January mean temperature	7.435	12.023	11.928
ln July mean temperature	-239.298	-197.062	-205.641
ln elevation	-2.594	-2.661	-2.689
Major Land Surface Form			
1 - Flat Plains	base	base	base
2 - Smooth Plains	-2.407	-0.668	N.S.
3 - Irregular Plains	-8.218	-4.319	-4.417
4 - Escarpments	-15.958	-15.073	-16.137
5 - Low Hills	N.A.	N.A.	N.A.
6 - Hills	-23.607	-13.247	-13.936
7 - Breaks/Foothills	-18.931	-13.599	-13.918
8 - Low Mountains	-34.302	-23.092	-22.361
9 - High Mountains	-234.446	-98.065	-98.199
10 - Drainage Channels	-16.618	-14.069	-14.371