

# Social Connectedness Index

# Introduction

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  - Approach 1: Combine with other data at individual level
    - Bailey, Cao, Kuchler, Stroebel (2018, JPE): Housing Markets
    - Bailey, Davila, Kuchler, Stroebel (2019, REStud): Mortgage Choice
    - Bailey, Johnston, Kuchler, Stroebel, Wong (2019): Cell-phone adoption
    - With Chetty, Hendren, Jackson: Social mobility
    - BUT: Limited outcome variables, not scalable.

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  - Approach 2: Aggregate networks to a geographic level where we can measure economic activity and socio-economic outcomes.



# Introducing the “Social Connectedness Index” (SCI)

- Underlying data: Anonymized Facebook social graph
  - Facebook a platform to maintain a profile and communicate with friends.
  - 2.4 billion active users globally; 243 million in U.S. & Canada
  - Friendship links require approval of both sides
  - In U.S., mainly real-world friends; 90% of Facebook friends have met more than once in real life (Jones et al., 2013).

## Definition: Social Connectedness Index

- Normalized number of friendship links between U.S. counties:

$$\text{Social Connectedness}_{i,j} = \frac{\text{Friendship Links}_{i,j}}{\text{FB Users}_i \times \text{FB Users}_j}.$$

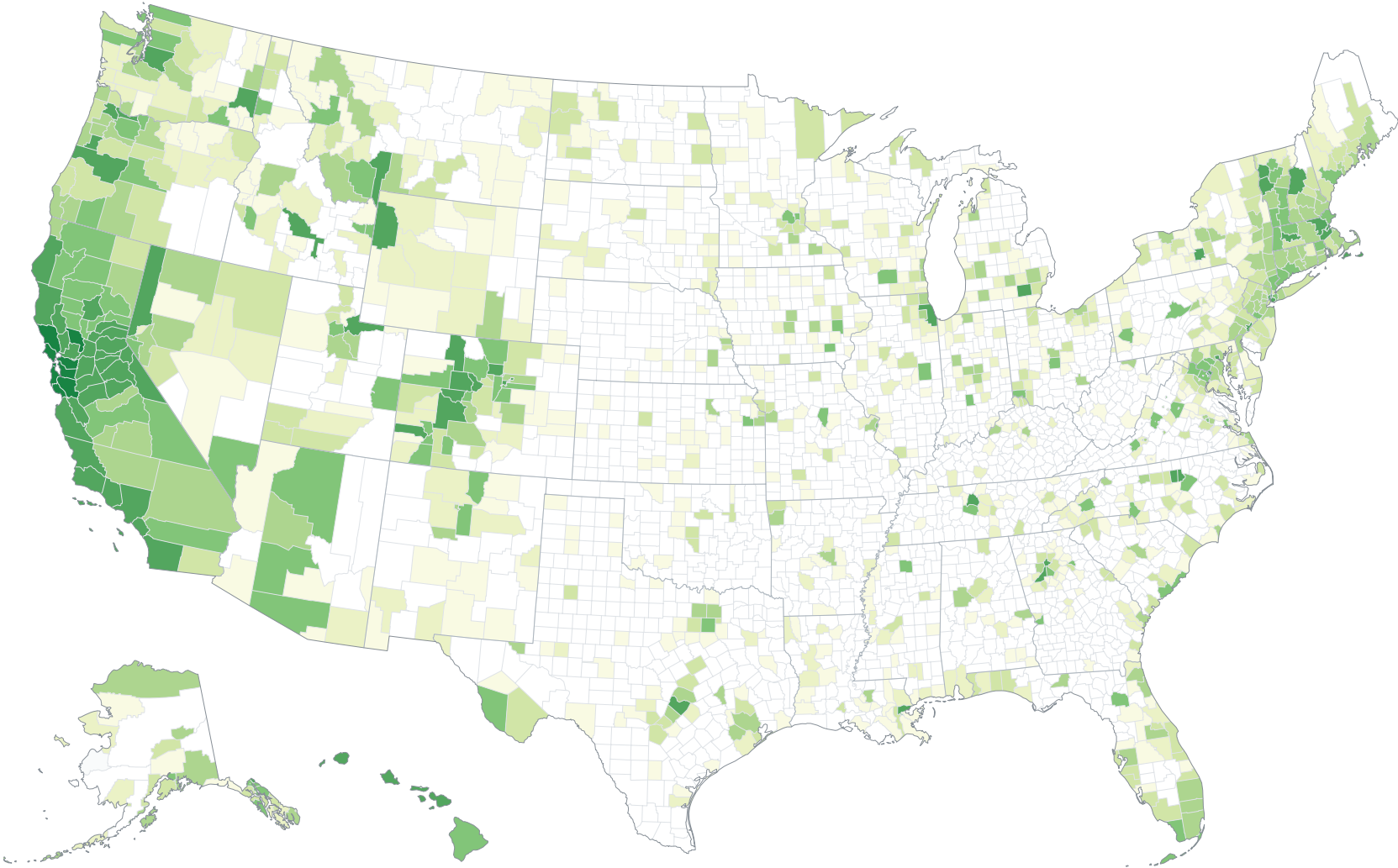
- Captures relative probability of friendship between Facebook users in location  $i$  and  $j$
- Independent of differences in population or users in each location

# “Social Connectedness Index” (SCI)

- SCI available at various levels of geographic aggregation:
  - U.S. Counties
  - US Zip codes
  - Countries
  - Subnational regions: NUTS2, NUTS3 in EU, GADM1 internationally
- Data available at:
  - <https://dataforgood.fb.com/tools/social-connectedness-index/>

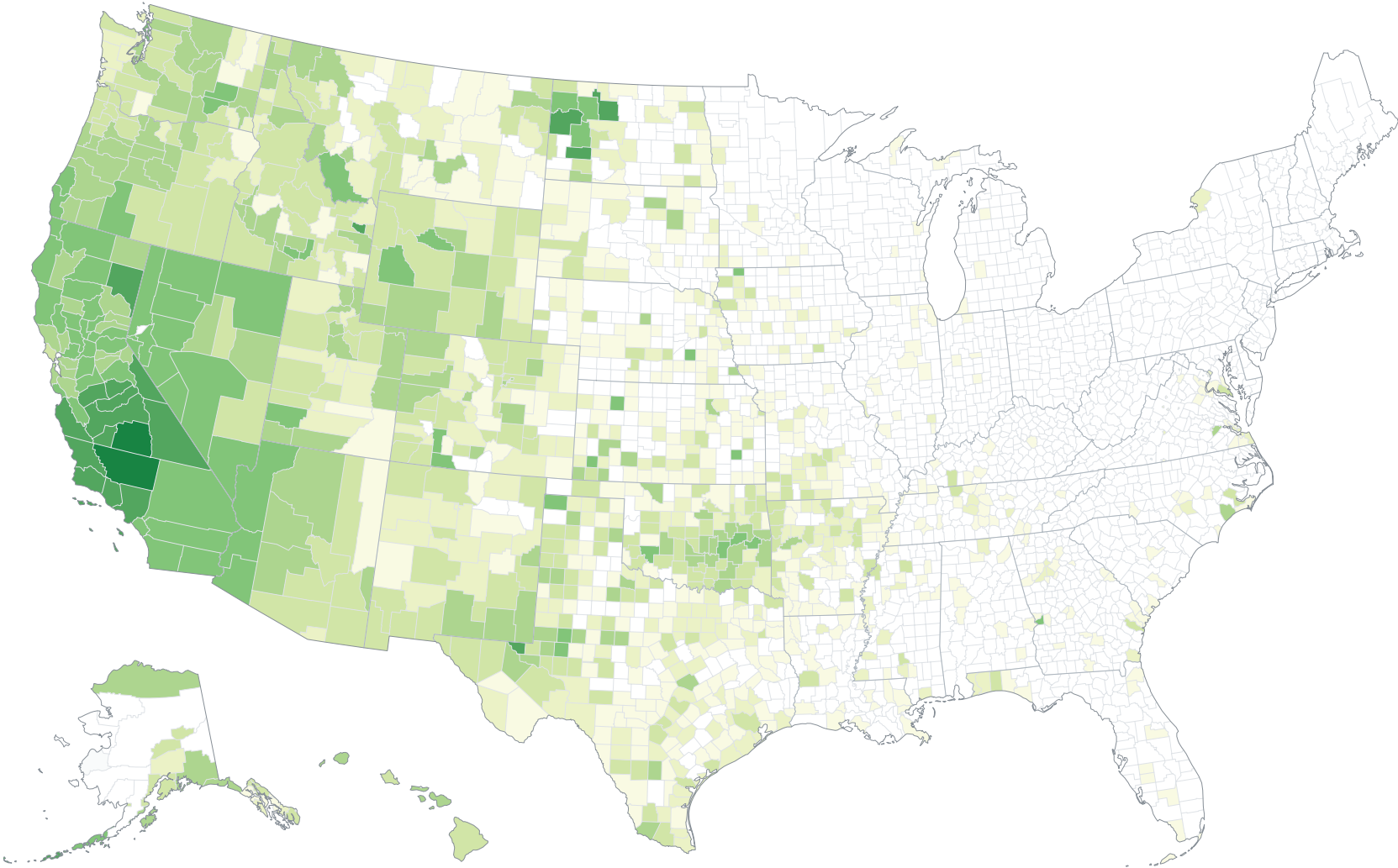
# Social Connectedness of U.S. Counties

# San Francisco County, CA



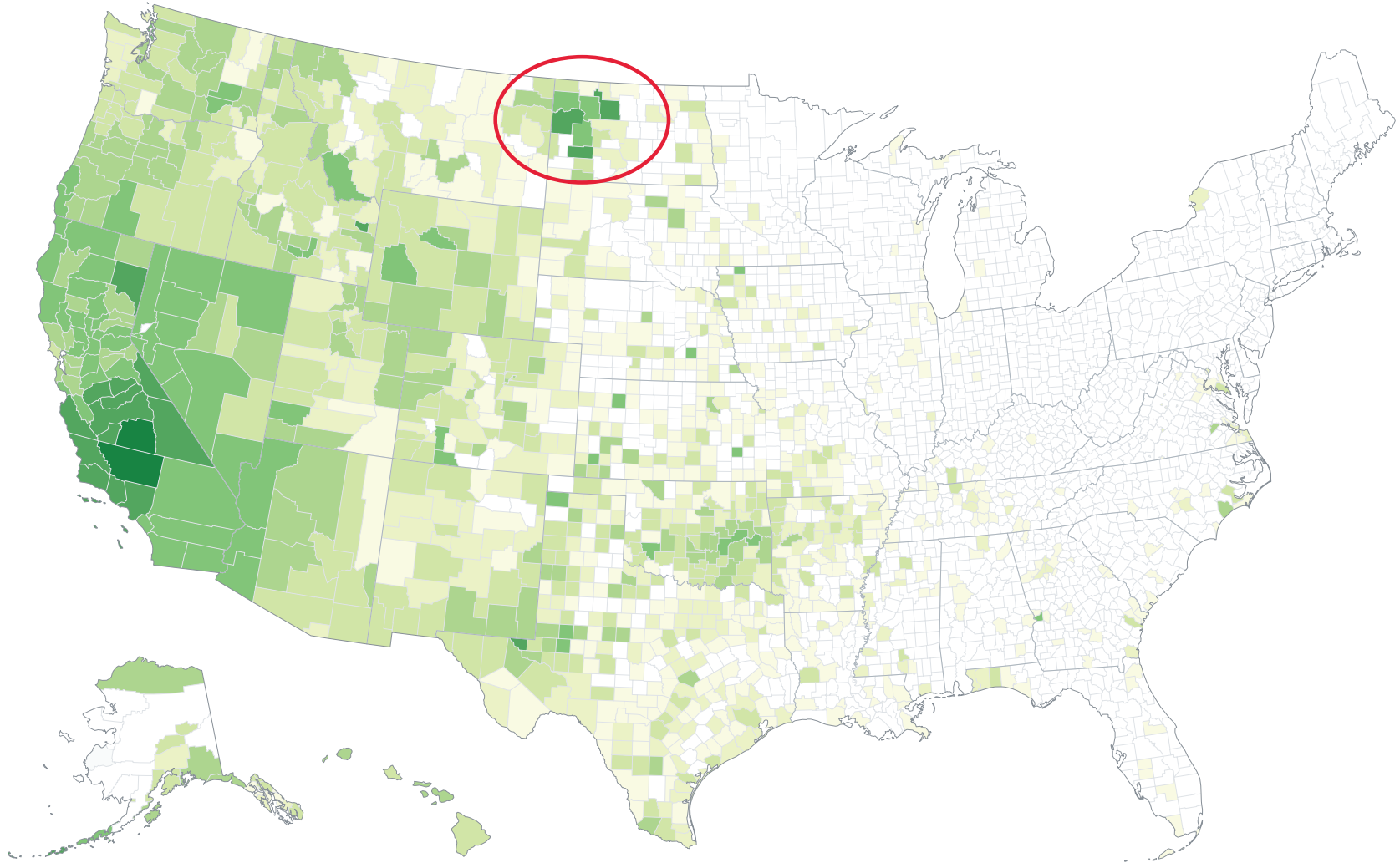
Data Source: Bailey, Cao, Kuchler, Stroebel, and Wong (2018, JEP)

# Kern County, CA (Bakersfield)



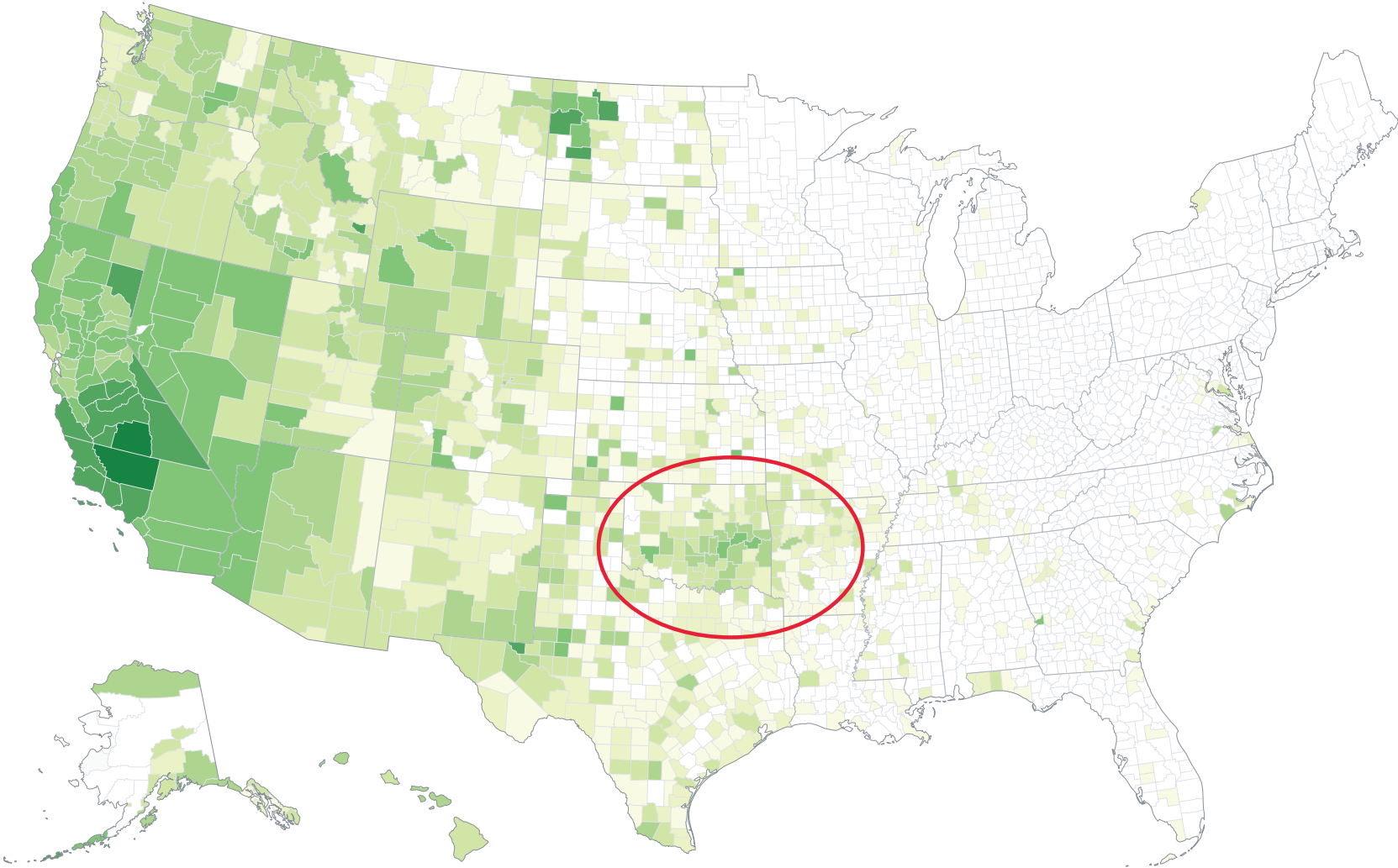
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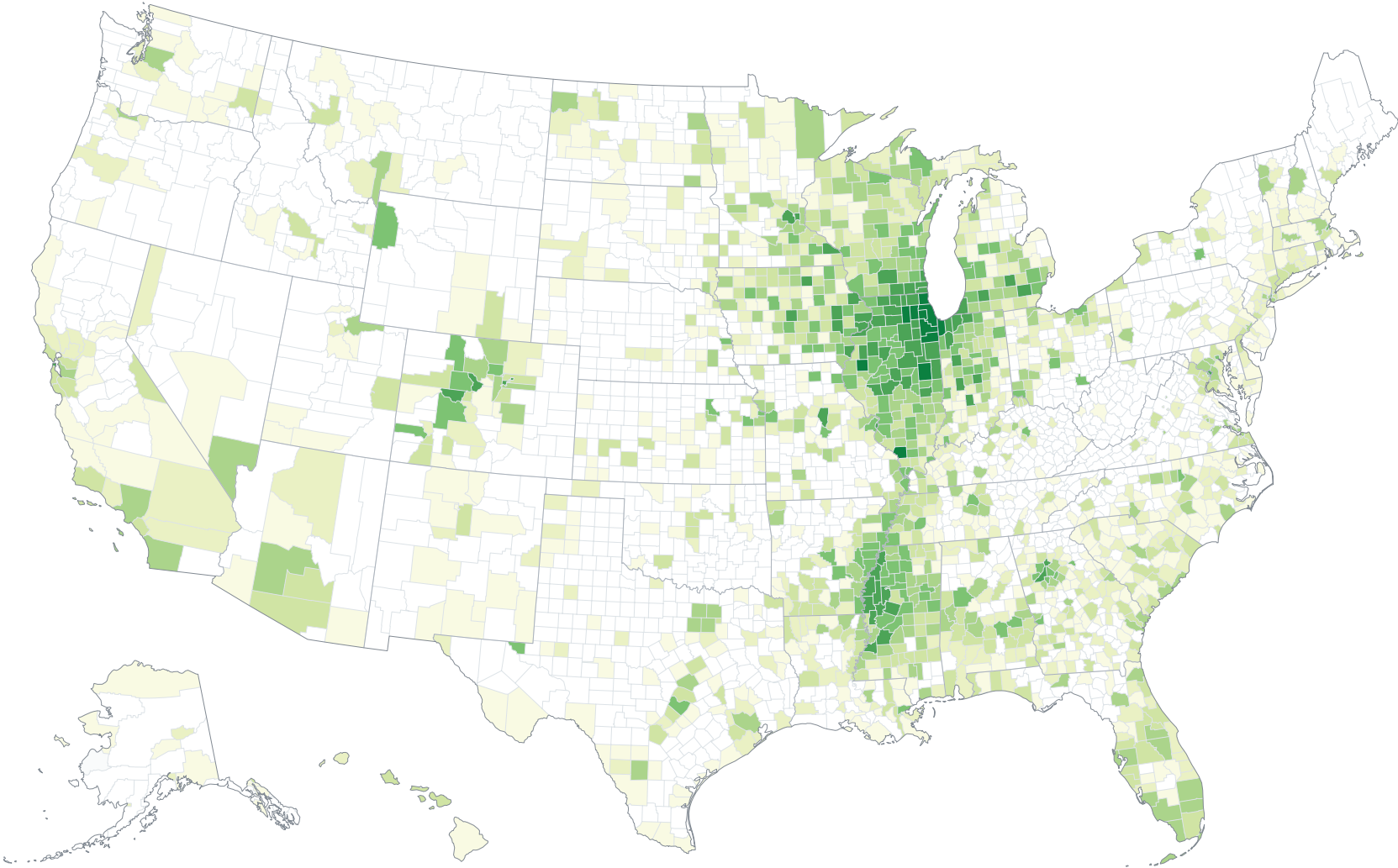
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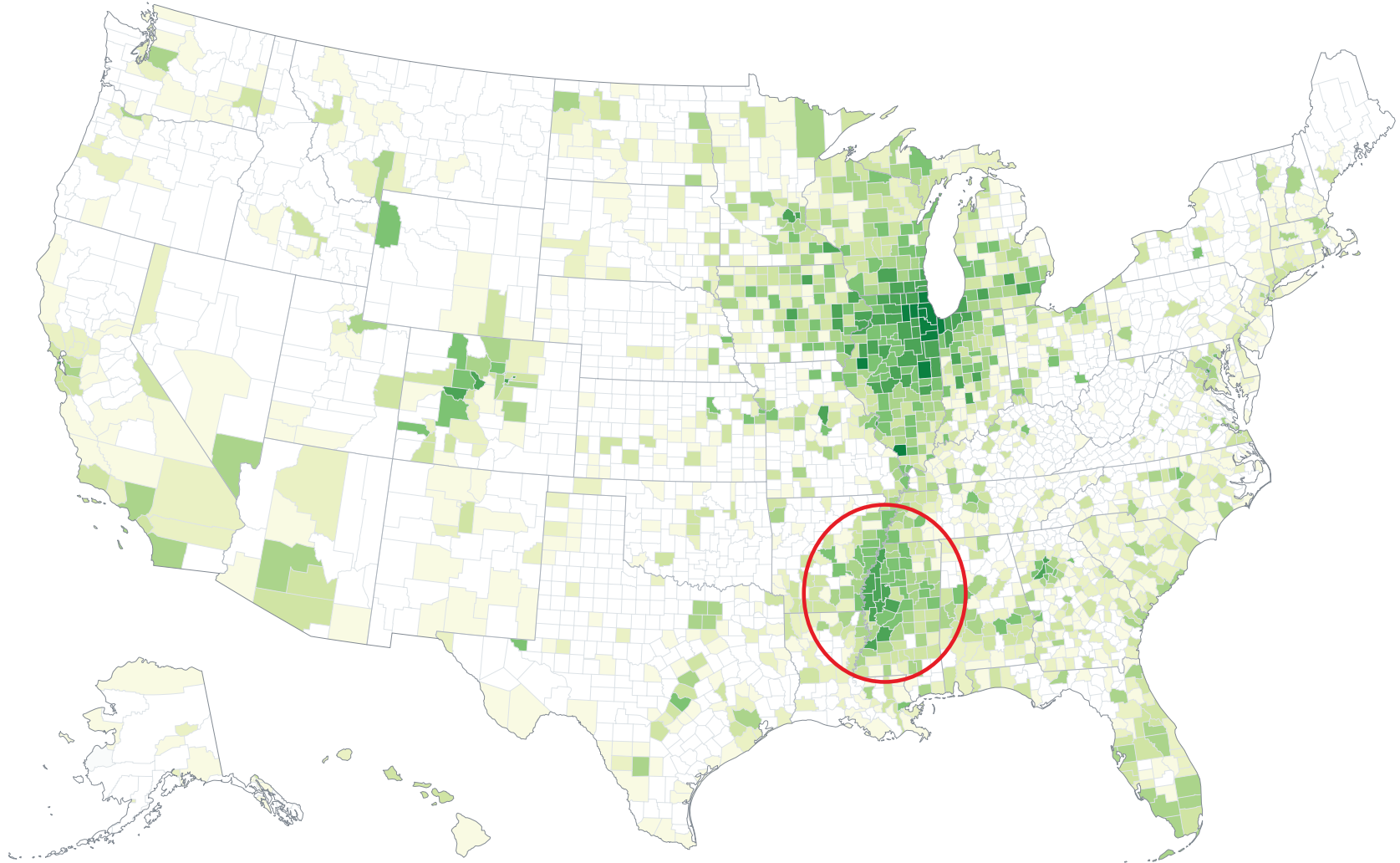


# Cook County, IL (Chicago)



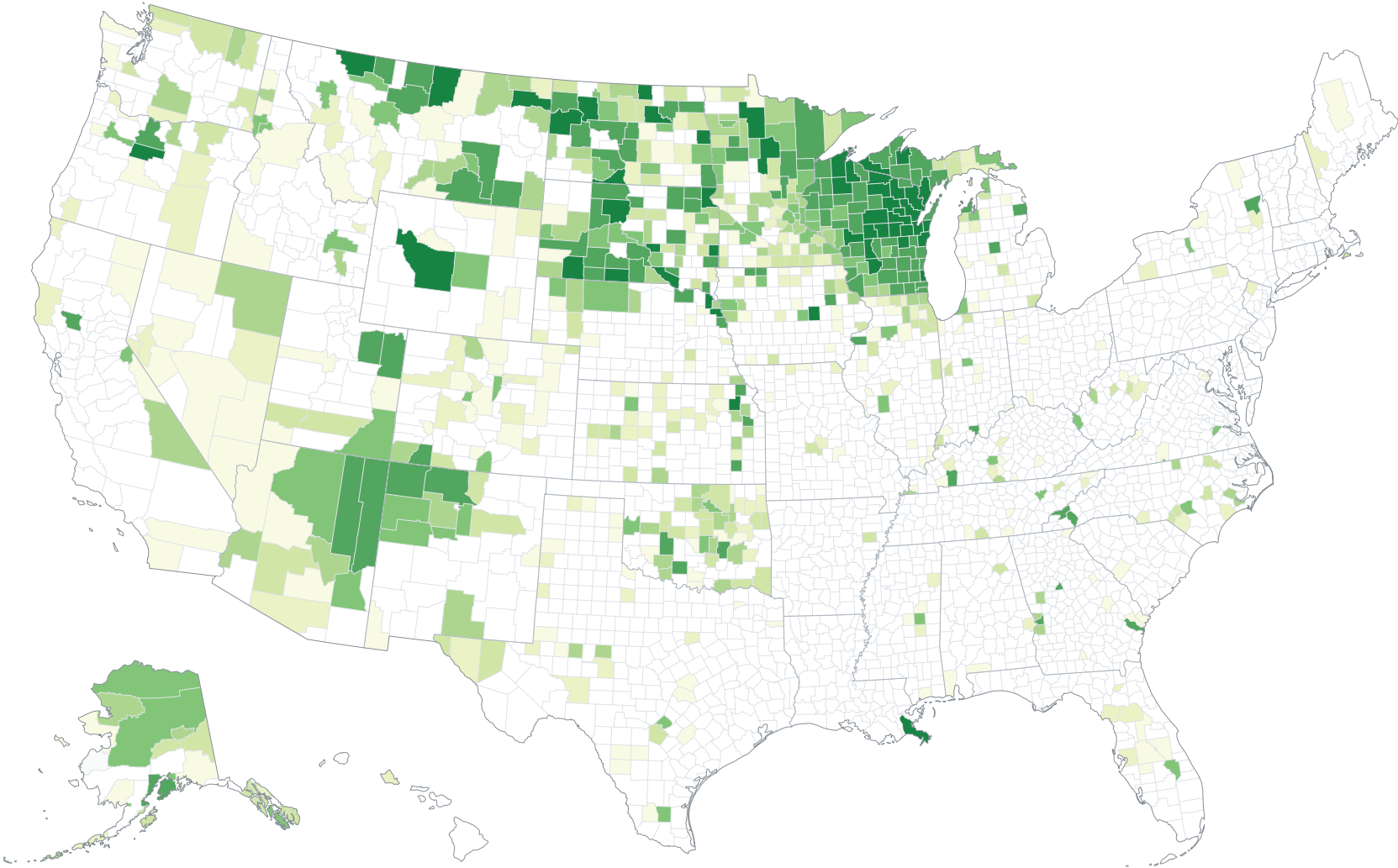
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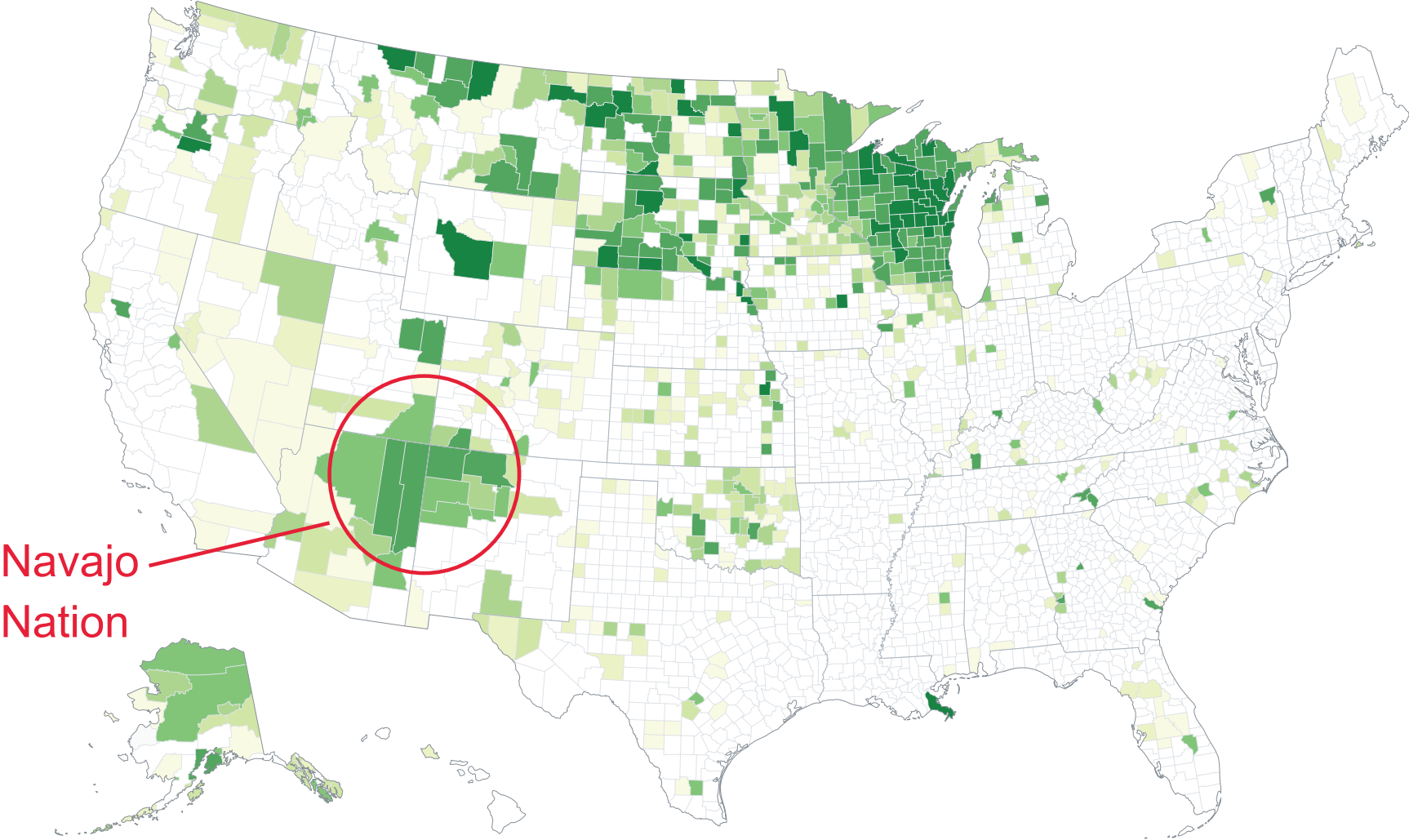
**Data Source:** Bailey, Cao, Kuchler, Stroebel, and Wong (2018, JEP)

# Menominee County, WI



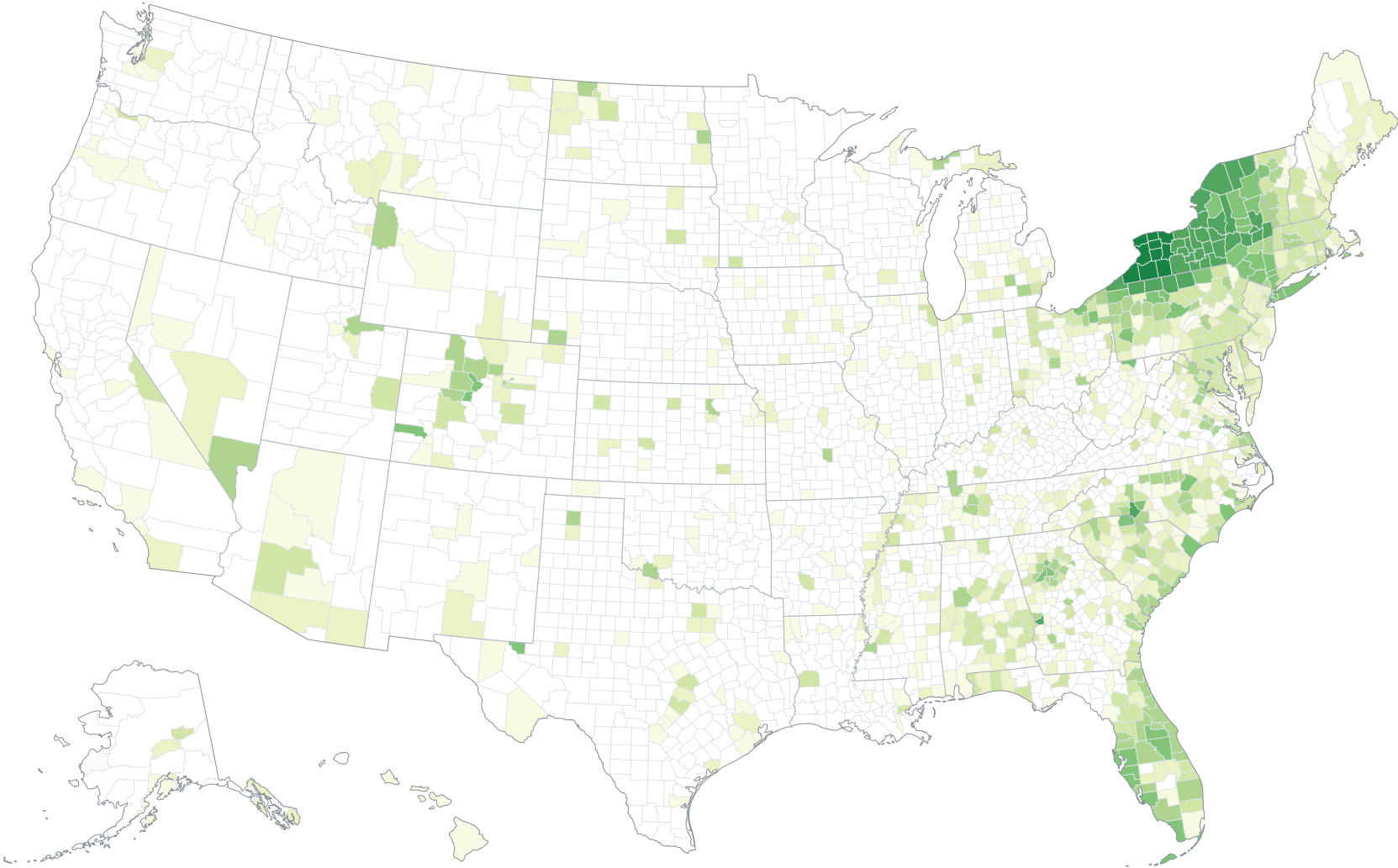
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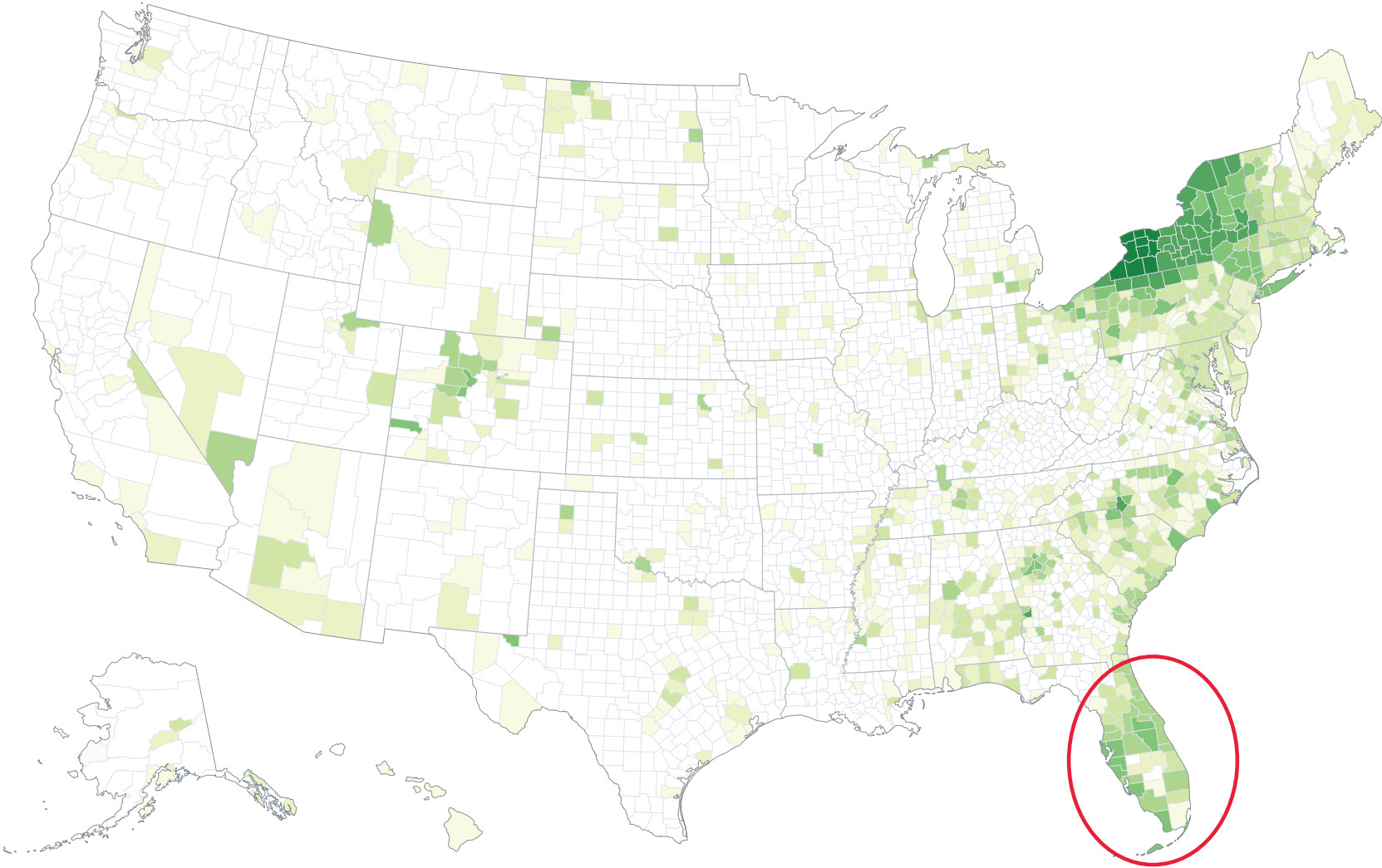
# Erie County, NY (Buffalo)



Data Source: Bailey, Cao, Kuchler, Stroebel, and Wong (2018, JEP)

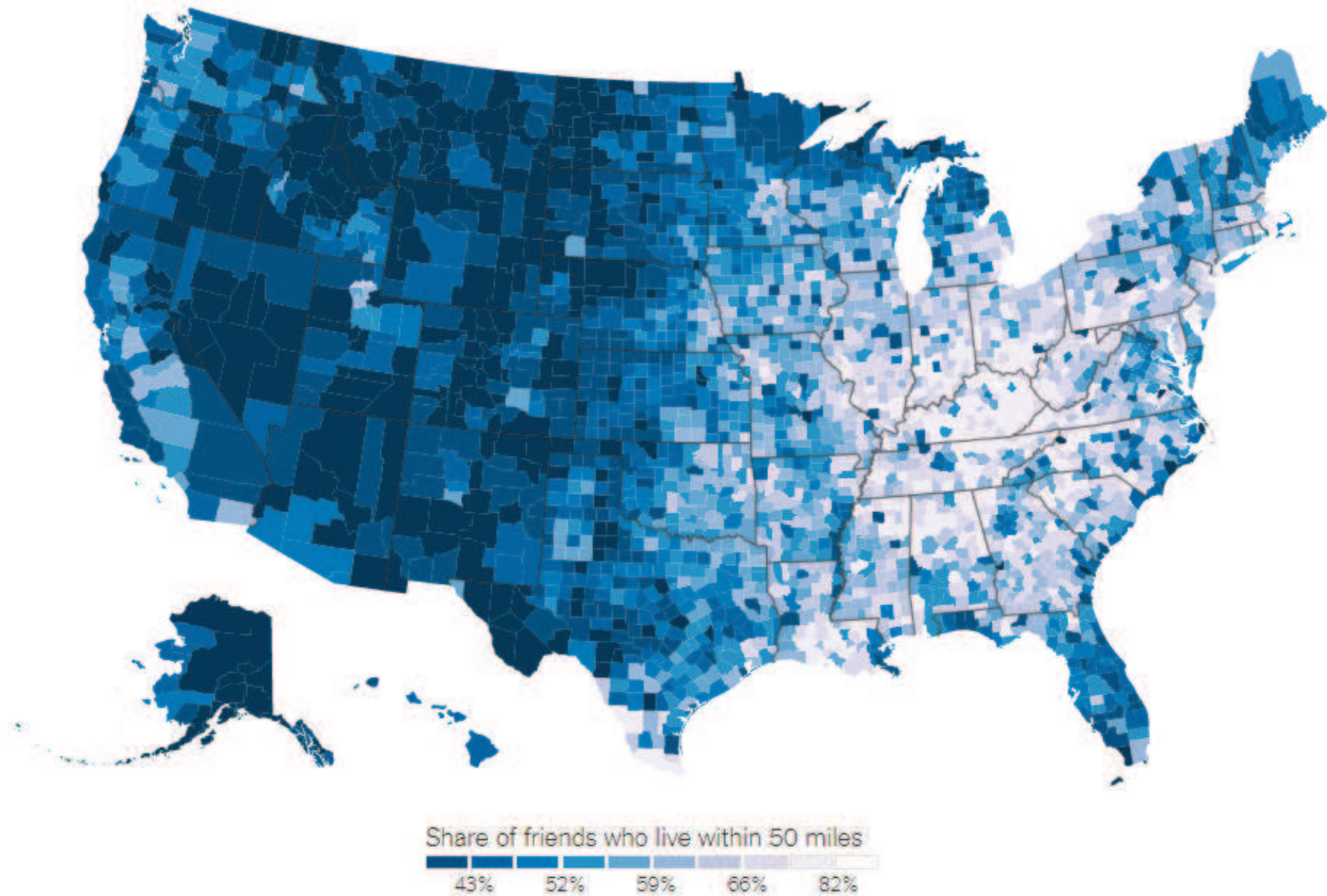


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# Geographic dispersion of social networks



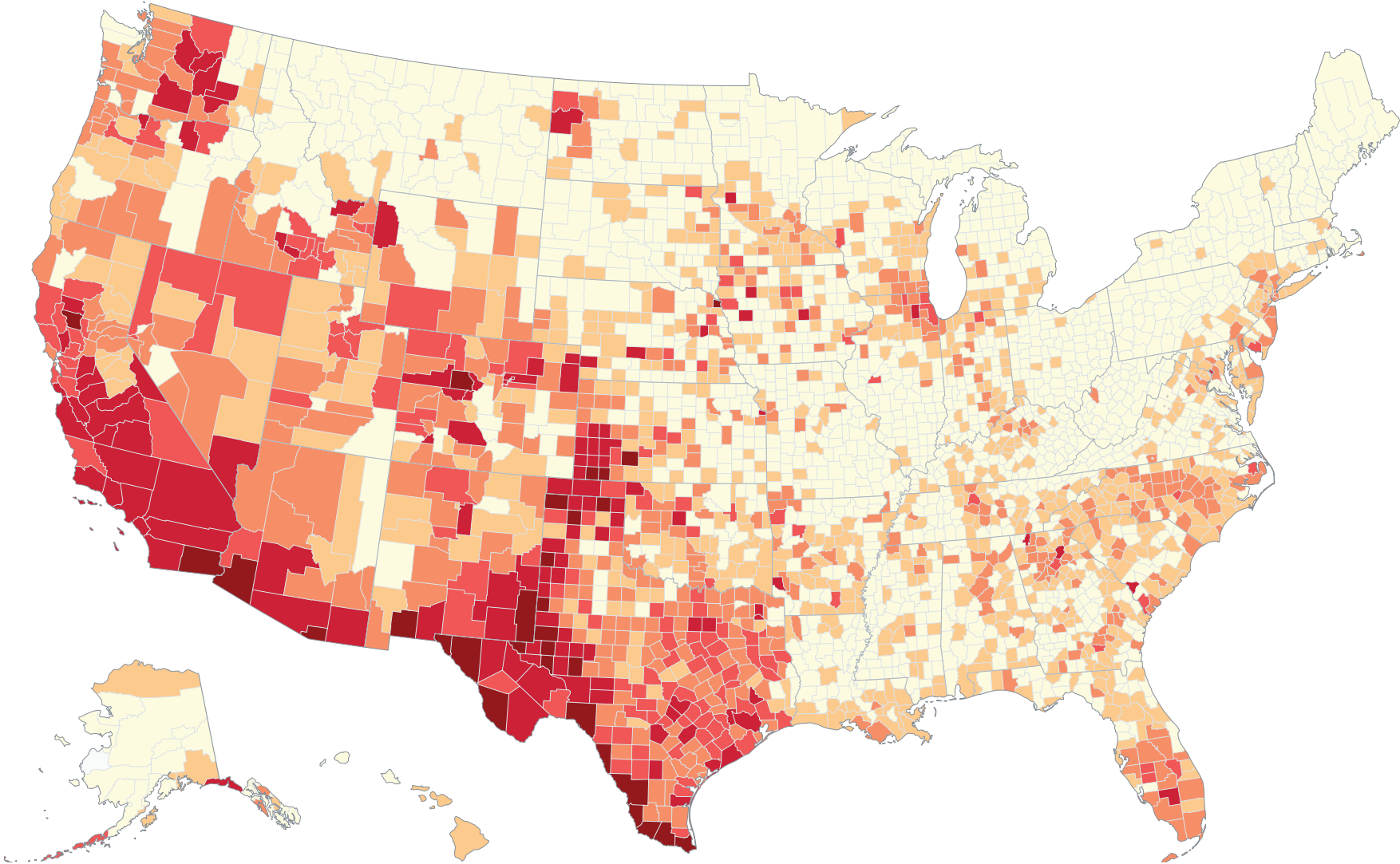
# International Social Connectedness



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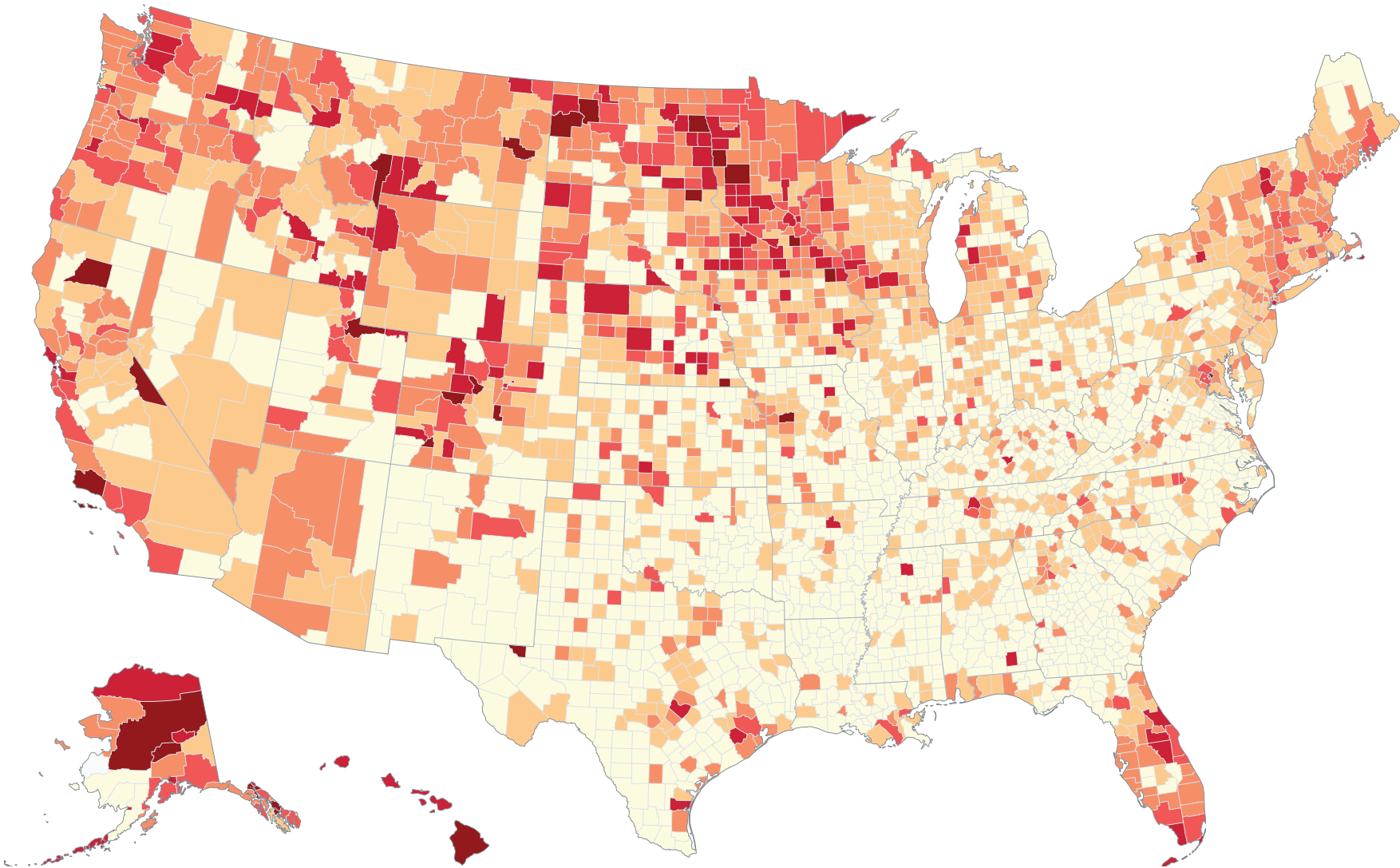
- Social Connectedness of US counties/ ZIP codes to international countries
- Country to country connections
- Social Connectedness of international regions (NUTS2, NUTS3,GADM)

# Social Connectedness to Mexico



Data Source: Bailey, Cao, Kuchler, Stroebel, and Wong (2018, JEP)

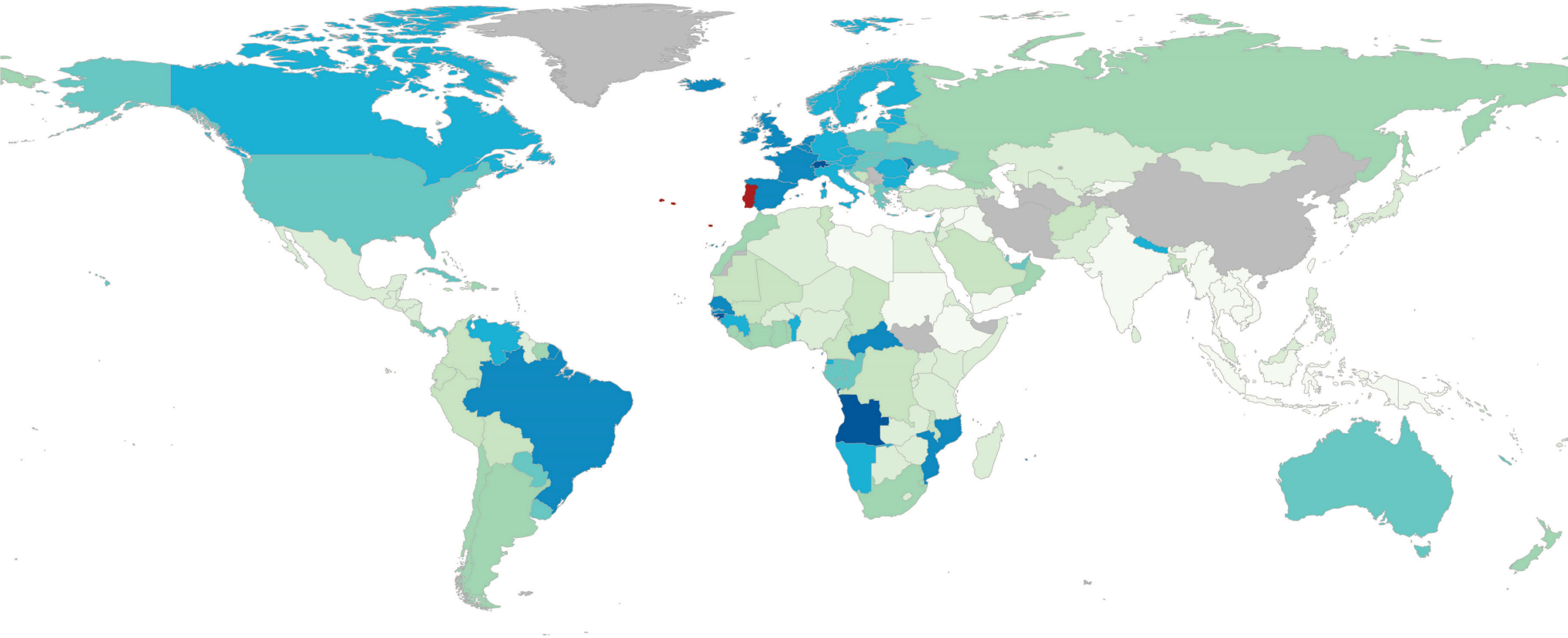
# Social Connectedness to Norway



Data Source: Bailey, Cao, Kuchler, Stroebel, and Wong (2018, JEP)

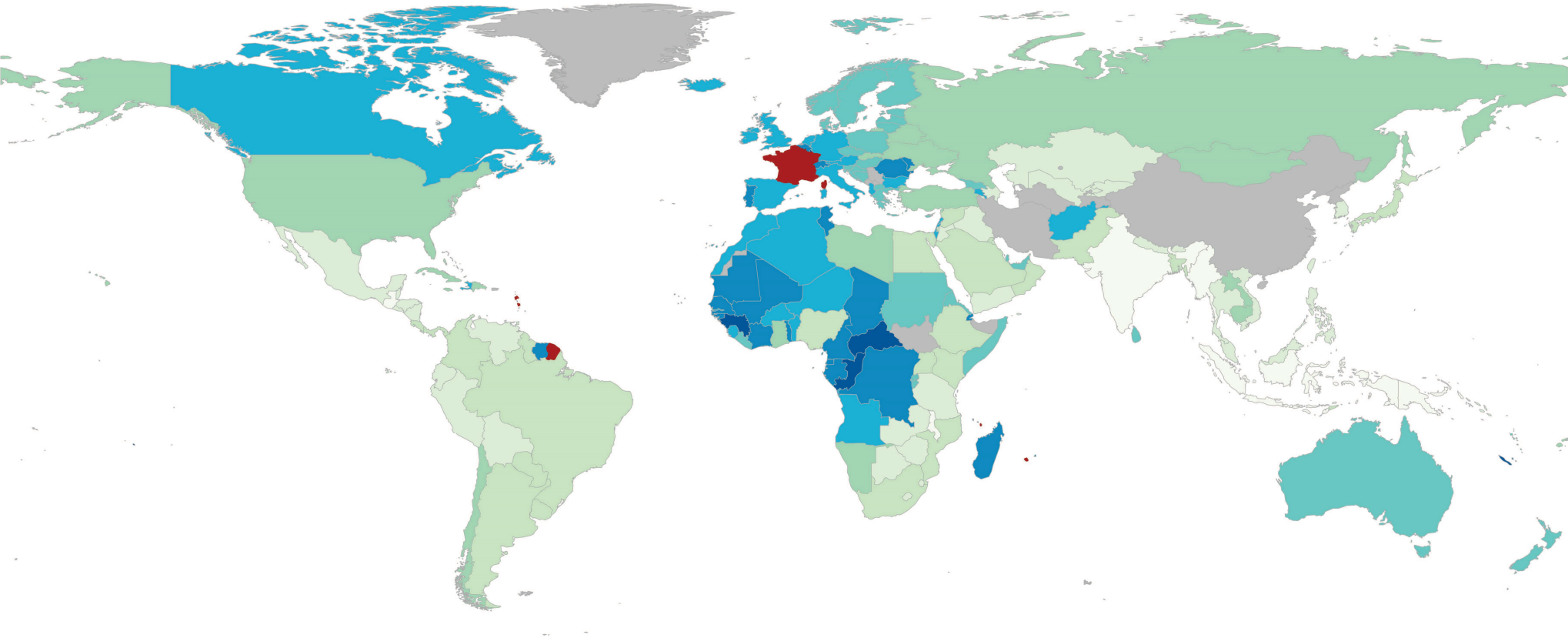
# International Social Connectedness

## Portugal



# International Social Connectedness

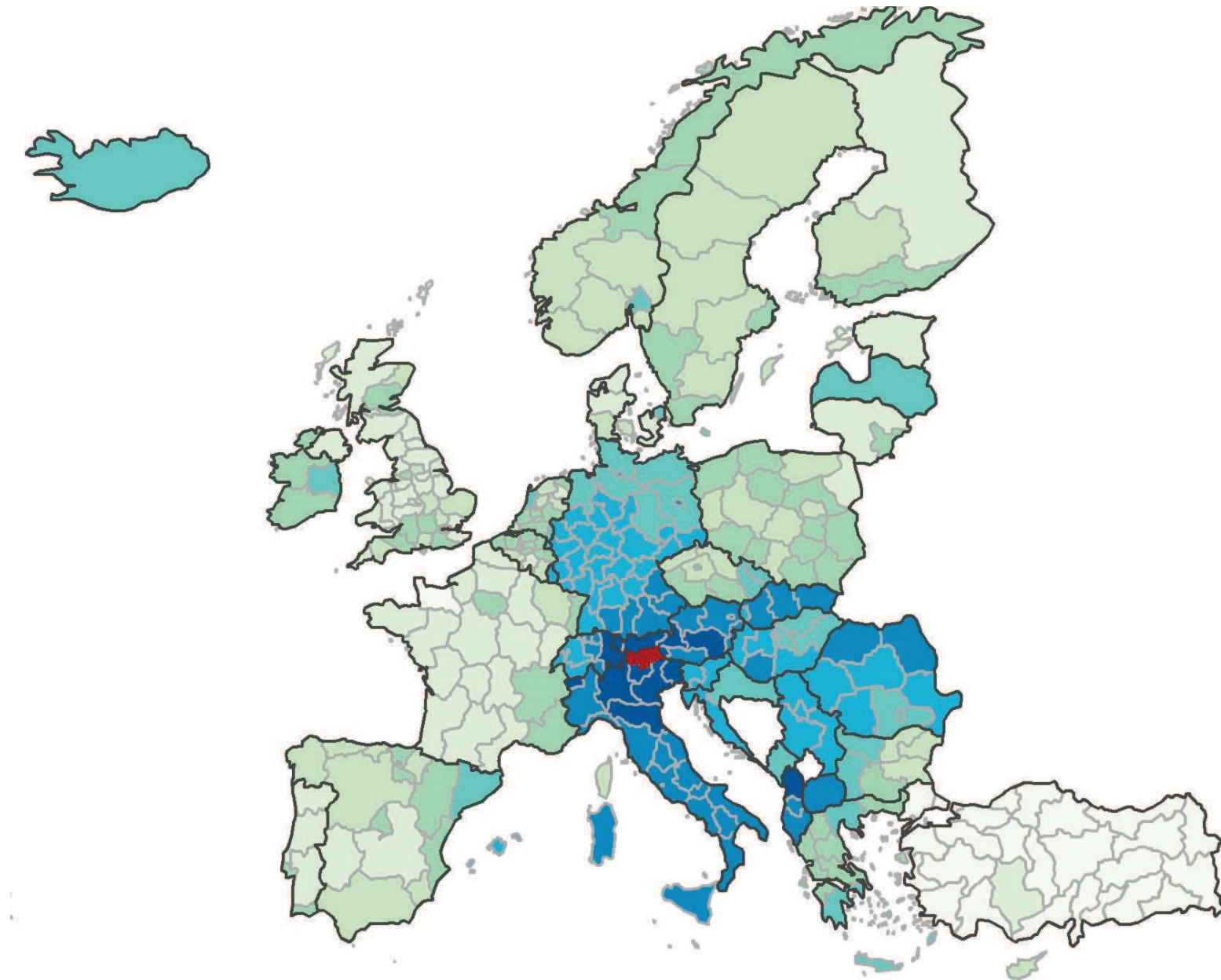
## France





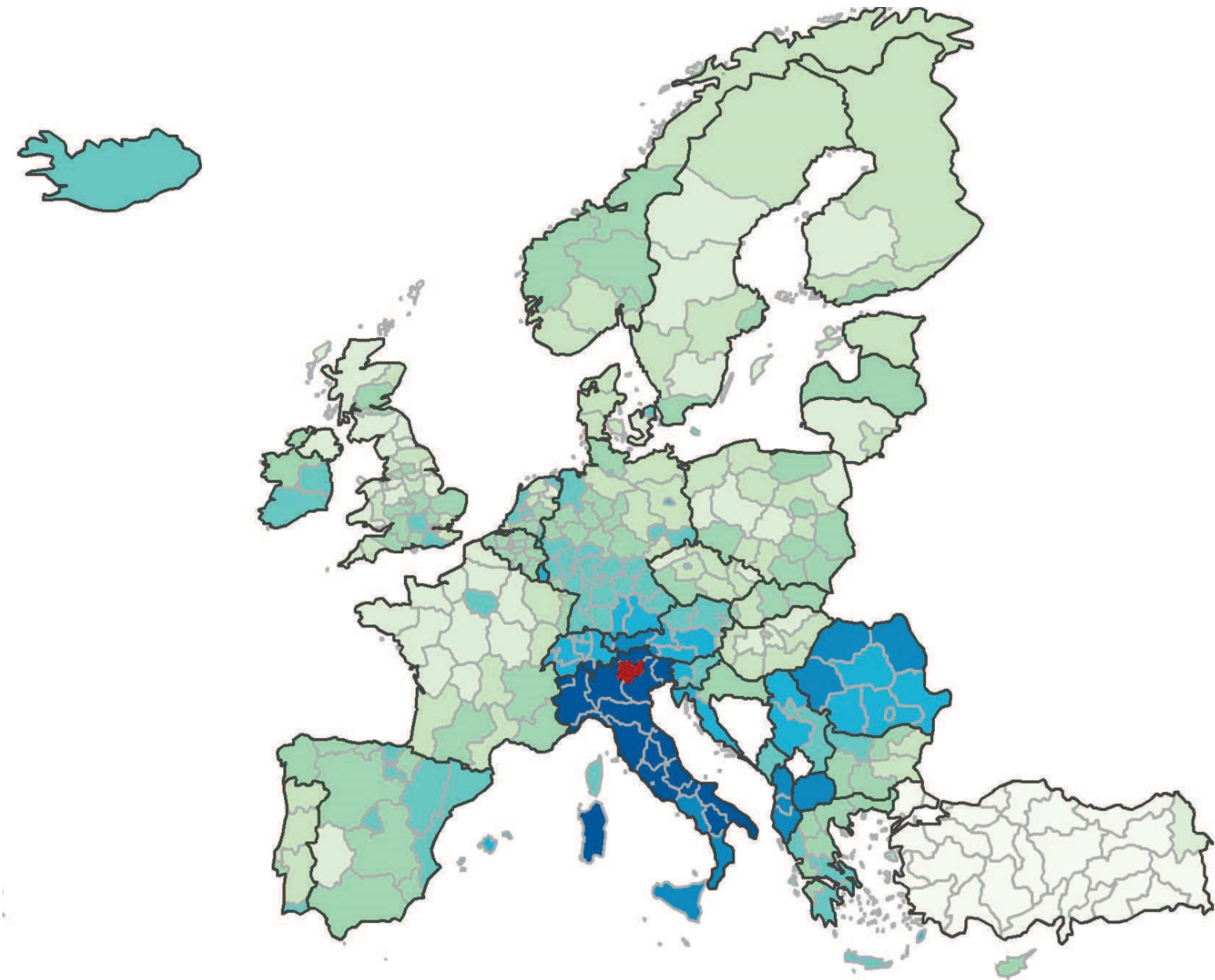
# International Social Connectedness

Italy - Bolzano



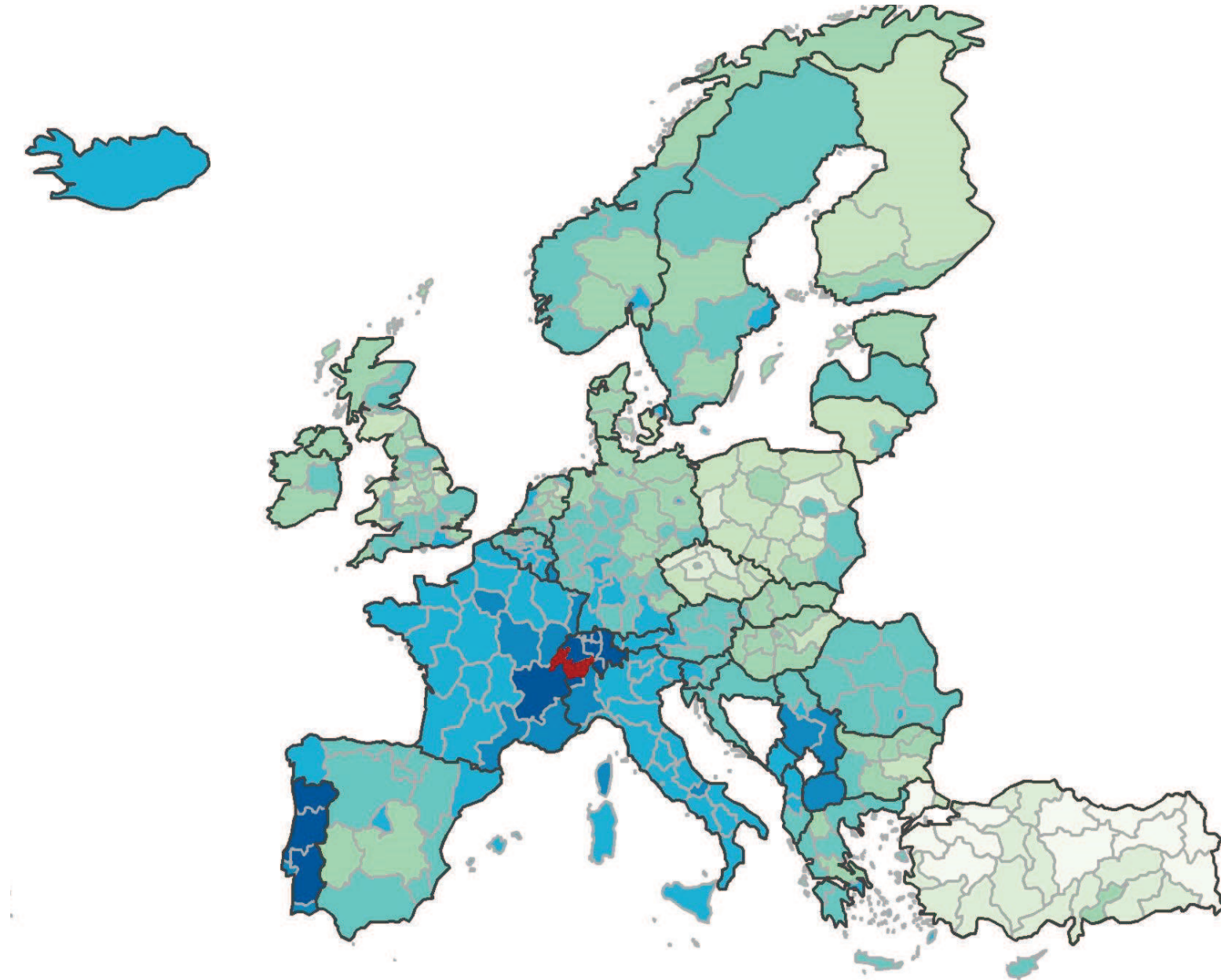
# International Social Connectedness

Italy - Trento



# International Social Connectedness

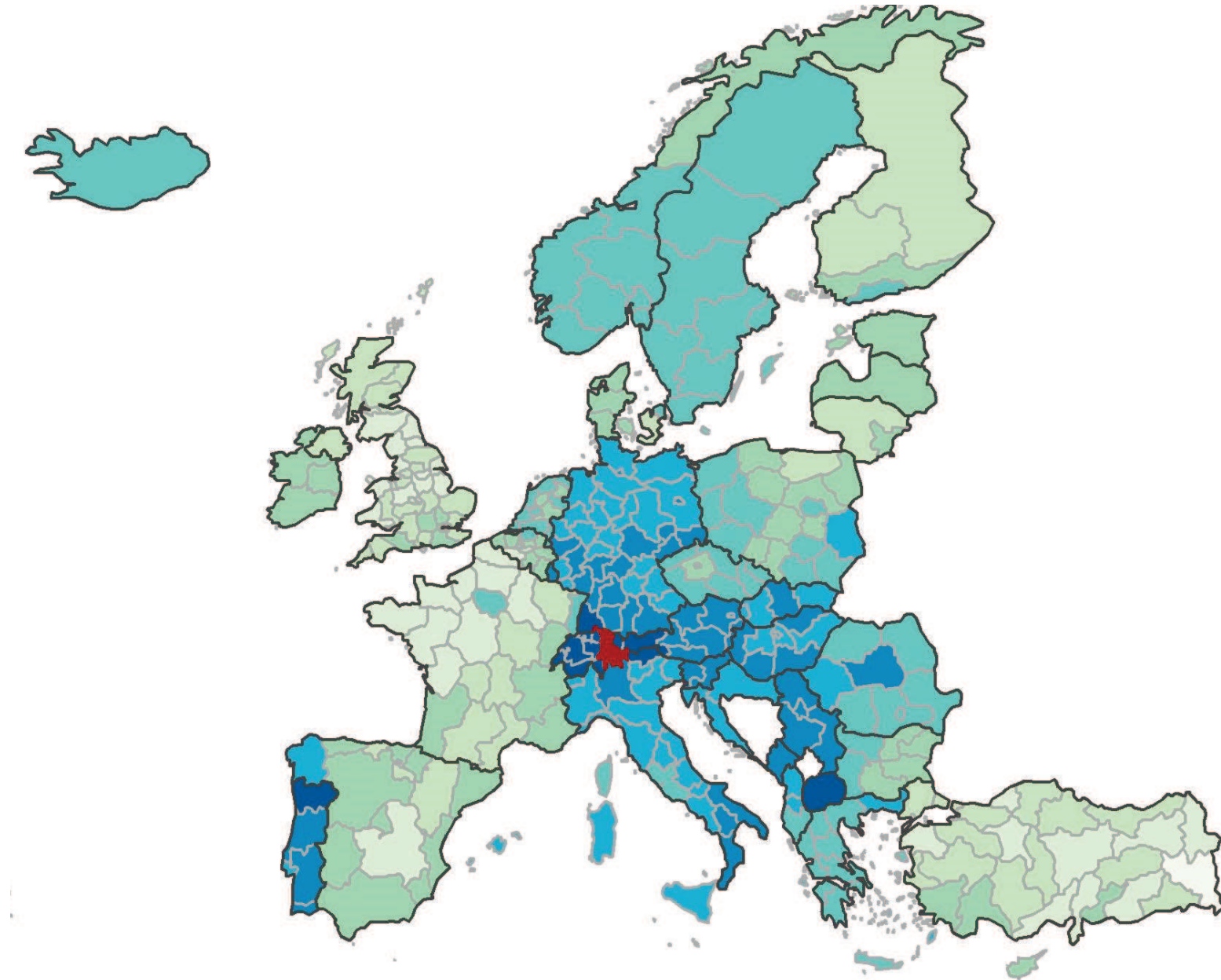
Switzerland - Geneva





# International Social Connectedness

Switzerland - Zentralschweitz



# Determinants of Social Connecteness

- Geography
- Homophily: More similar → more connected
  - Demographics (income, education, political orientation, religion, ethnicity)
  - Language
- History
  - Migration
  - Colonial history
  - Historical borders

# Research Using Social Connectedness Index

# Bailey, Cao, Kuchler, Stroebel, Wong, 2018, JEP

## Social Connectedness: Measurement, Determinants, and Effects

- Paper defines and introduces the SCI
- Explores patterns at the U.S. County Level
- Documents that social connectedness is correlated with
  - County-County Migration Flows
  - Patent citations
  - State-level trade flows
- Explores geographic concentration of networks vs. socio-economic outcomes

# Bailey, Farrell, Kuchler, Stroebel, 2020, JUE

## Social Connectedness in Urban Areas

- Explores patterns of social connectedness across NYC zip codes
- Documents that social connectedness varies substantially more with public transit infrastructure than with geographic distance
  - Social interactions central to agglomeration externalities
  - Highlights important value of public transit infrastructure
  - Public transit particularly important to provide social connections between areas of different incomes.
- Social connectedness also correlated with economic flows such as commuting
  - Suggestive that social networks can help with finding jobs

# Bailey, Johnston, Kuchler, Russel, State, Stroebe, SocInfo20

## Social Connectedness in Europe

- Explores patterns of social connectedness in Europe
- Long-lasting effects of political unions
  - Regions that were part of Austro-Hungarian Empire still more connected today, conditional on today's borders and other controls
- Social connectedness to other European Countries associated with decline in Euroscepticism

# Bailey, Gupta, Hillenbrand, Kuchler, Richmond, Stroebel, WP

## International Trade and Social Connectedness

- Explores patterns of social connectedness across the world
- Documents that trade flows strongly declining in social connectedness
  - Substantially reduces the importance of geographic distance
  - More important for countries with weak rule of law (social connections = substitute for formal contract enforcement)
  - More important for more sophisticated products (social connections = source of information)
  - Does not seem to be result of reverse causality
- Asset flows also increasing in social connectedness, in particular for information sensitive equity

# Kuchler, Li, Peng, Stroebe, Zhou, WP

## Social Proximity to Capital: Implications for Investors and Firms

- Investors are more likely to invest in firms from regions that are socially connected to the location of the fund
  - Social connectedness matters more for smaller + informationally opaque firms
- Equilibrium asset market outcomes
  - Social Proximity to Capital: Social connections to high-AUM regions
  - $\uparrow$  SPC  $\rightarrow$   $\uparrow$  Firm Valuation,  $\uparrow$  Firm liquidity
- Performance of institutional investors is unaffected (not info-based)



## Other research papers

- **Wilson (2020)**: Studies how adoptions of EITC claiming behavior spreads through social networks
- **Ratnadiwakara (2020)**: Shows how exposure to regions hit by Hurricanes purchase more flood insurance
- **Kuchler et al (2020)**: Shows that COVID-19 spreads along social networks as measured by Facebook
- **Rehbein and Rother (2020)**: Bank lending increasing in social connectedness
- Many other papers and works in progress

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