

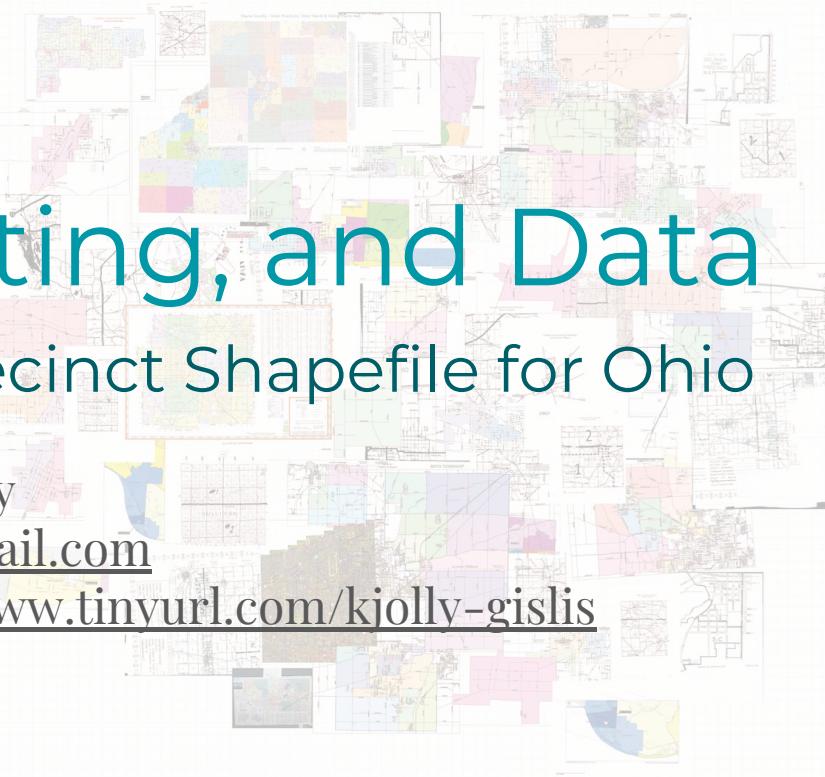
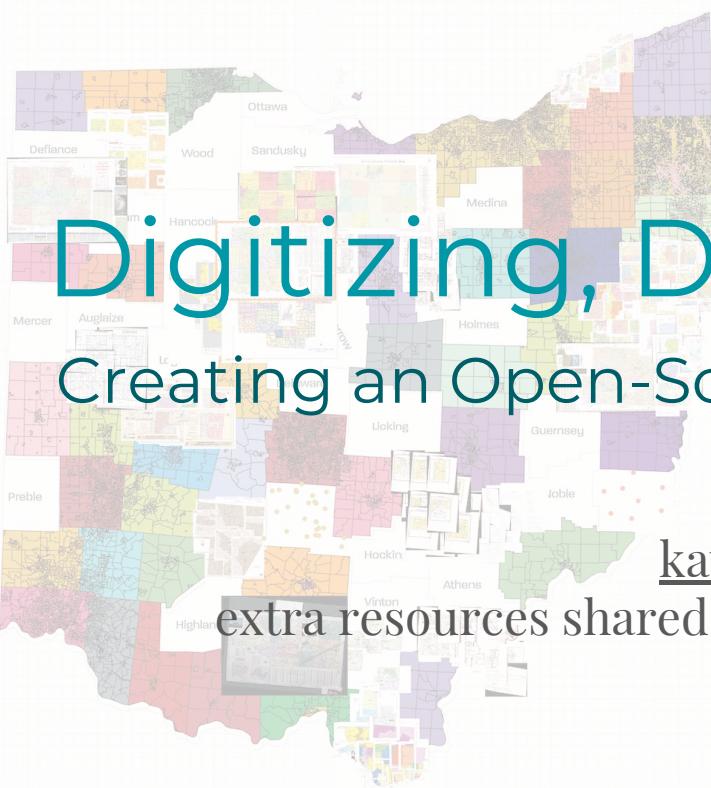
Digitizing, Districting, and Data

Creating an Open-Source Precinct Shapefile for Ohio

Katie Jolly

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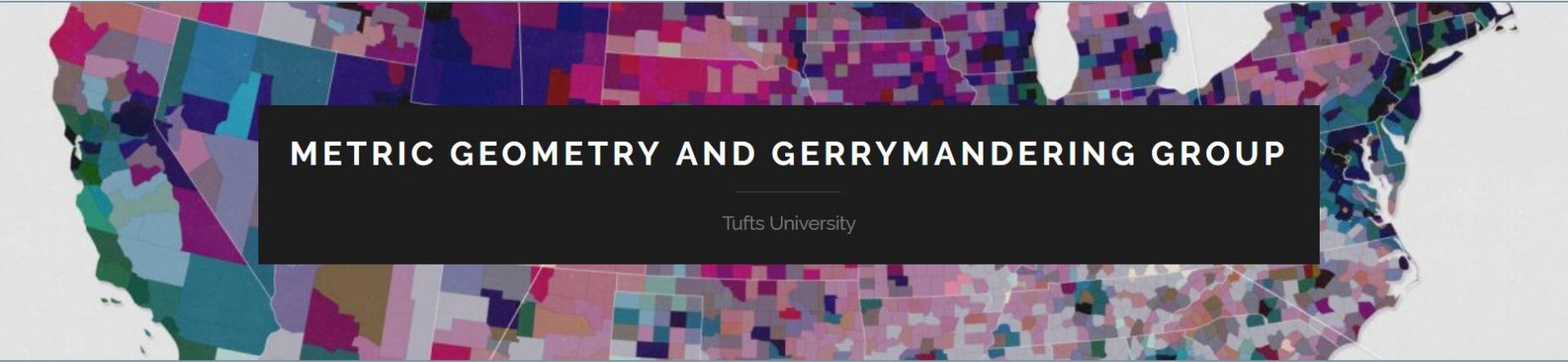
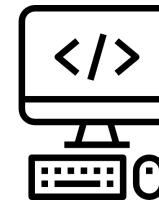
extra resources shared on <https://www.tinyurl.com/kjolly-gislis>



About me



MACALESTER



METRIC GEOMETRY AND GERRYMANDERING GROUP

A large, horizontal map of the United States is shown, divided into a fine grid of small, colored polygons. A central black rectangular box contains the text "METRIC GEOMETRY AND GERRYMANDERING GROUP".

Tufts University

Overview

1. **Why are precinct shapefiles important for voting rights?**
2. Creating the shapefile
3. Joining election data
4. Questions (and some answers) we had along the way

Why are precinct shapefiles important for voting rights?

PowerPost

Georgia voting rights activists move to block a plan to close two-thirds of polling places in a majority black county

Article by Vanessa Williams, Washington Post, August 18, 2018

Virginia Democrats propose redistricting plan to address racial gerrymandering, GOP calls it 'partisan power grab'

POLITICS

North Carolina's Gerrymandering Drama Is Only Going to Get Worse

Federal judges have ruled—again—that the state’s congressional map is unconstitutional. But it just used that map to elect candidates for November.

Article by Vann R. Newkirk II, The Atlantic, August 28, 2018

Article by Graham Moomaw, Richmond Times-Dispatch, August 29, 2018

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Where we started

88

counties in Ohio

450+

images to digitized

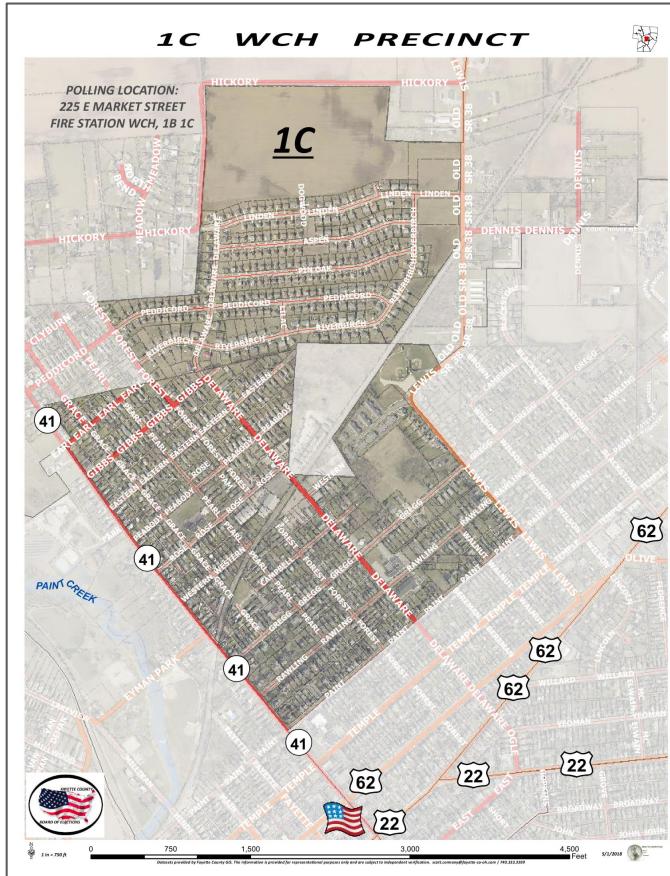
1,000,000+

addresses
geocoded



Map of Ohio counties
Source: wikipedia.org

Digitizing examples



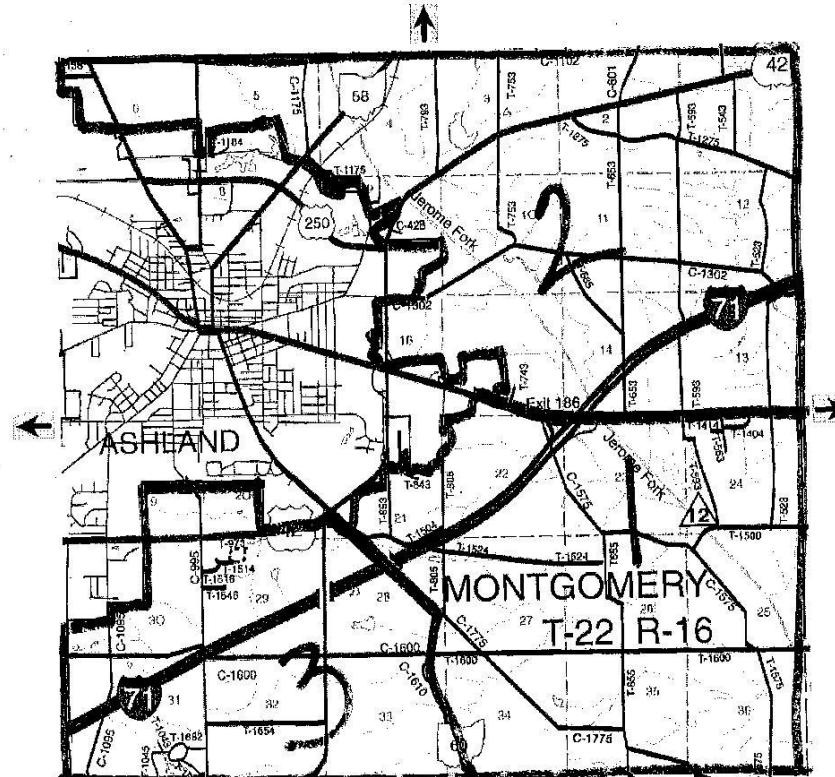
Fayette County

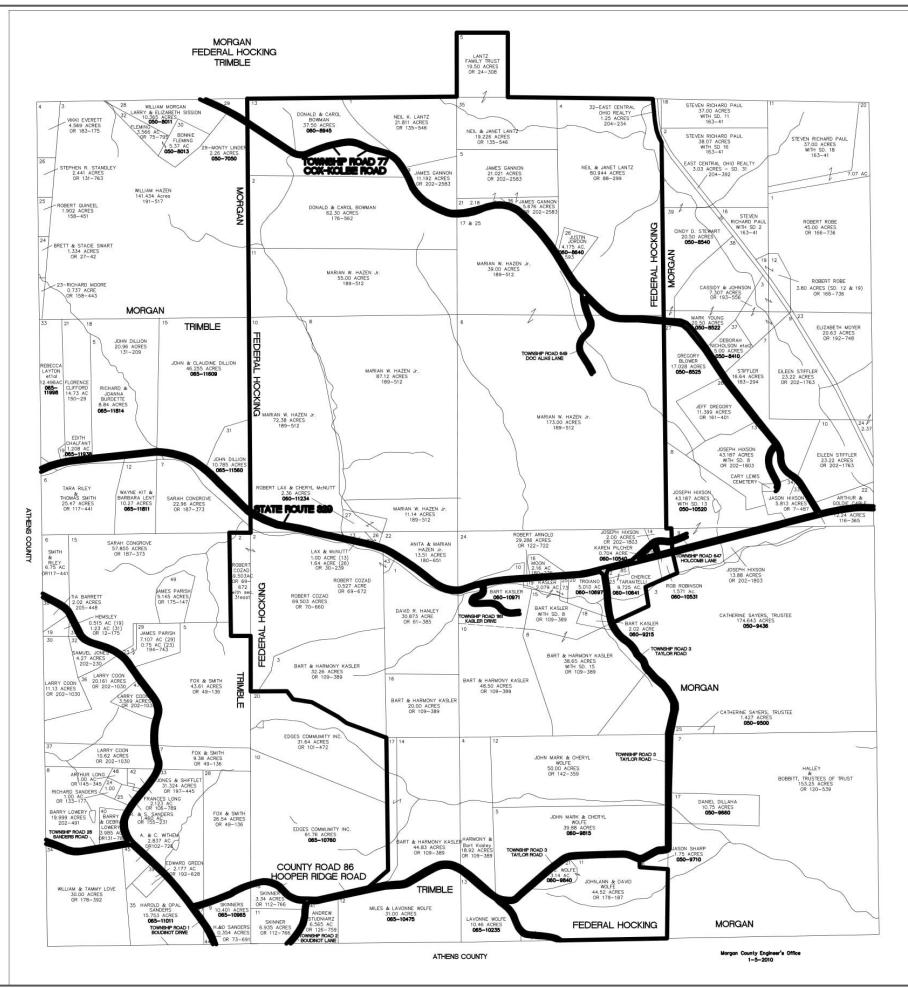
**Ashland
County
Townships**

Clearcreek
Township
Green
Township
Hanover
Township
Jackson
Township
Lake
Township
Mifflin
Township
Milton
Township
Mohican
Township
Montgomery
Township
Orange
Township
Perry
Township
Ruggles
Township
Sullivan
Township
Troy
Township
Vermillion
Township

**Cities,
Towns,
Villages,**

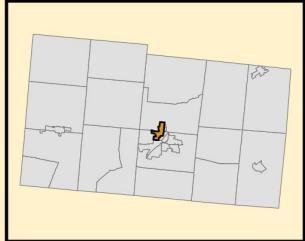
MONTGOMERY TOWNSHIP





Morgan County

CHAMPAIGN COUNTY PRECINCTS

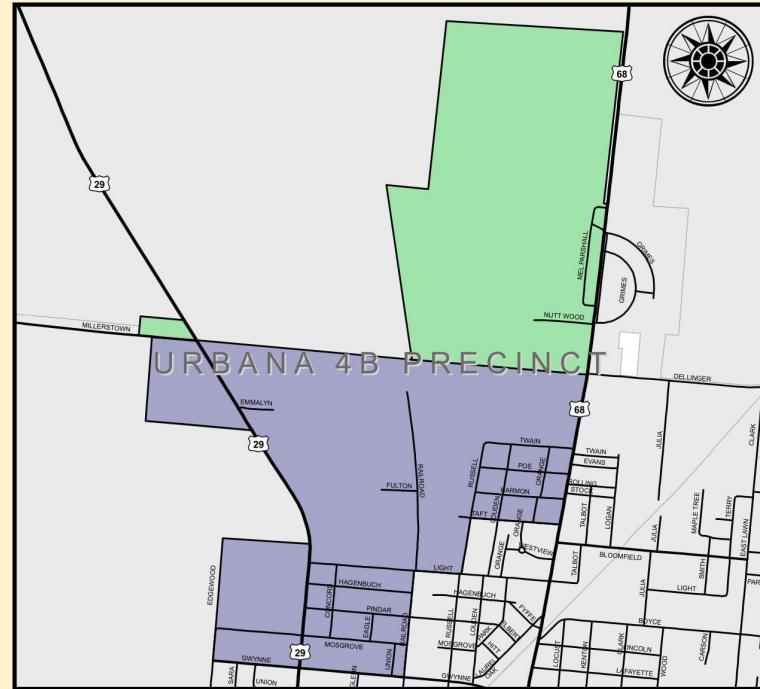


THE CHAMPAIGN COUNTY
BOARD OF ELECTIONS
1512 S. U.S. Highway 68, Suite L-100
Urbana, OH 43078
Telephone: 937-484-1575
Fax: 937-484-1578
E-mail: champaig@sos.state.oh.us

0 0.15 0.3 0.6 Miles

KATHY A. MEYER
DIRECTOR
MEREDITH L. BODEY
DEPUTY DIRECTOR
MEMBERS OF THE BOARD
Robert G. Hamilton
Lynn R. Mitchell
Steve A. Morris

SPLITS
URBANA TWP
SALEM TWP



URBANA 4B PRECINCT CHAMPAIGN COUNTY OHIO

Sources: Office of the Champaign Co. Engineer
Precinct data from Champaign Co. Board of Elections
For planning purposes only. Not for legal use.
Champaign Co. Engineer: Stephen McCall P.E., P.S.
Map created by: Steve Lambburg
(Champaign Co. Engineer's Office)
Coordinate System: NAD 1983 StatePlane Ohio South
Projection: Lambert Conformal Conic Datum: North American 1983
FIPS 3402 Feet, Units: Foot US, July 14, 2015

Champaign
County



Crawford County



We're on your way.

Welcome to **NOBLE COUNTY**

Community Spirit
Working For All

← Historic Village Square



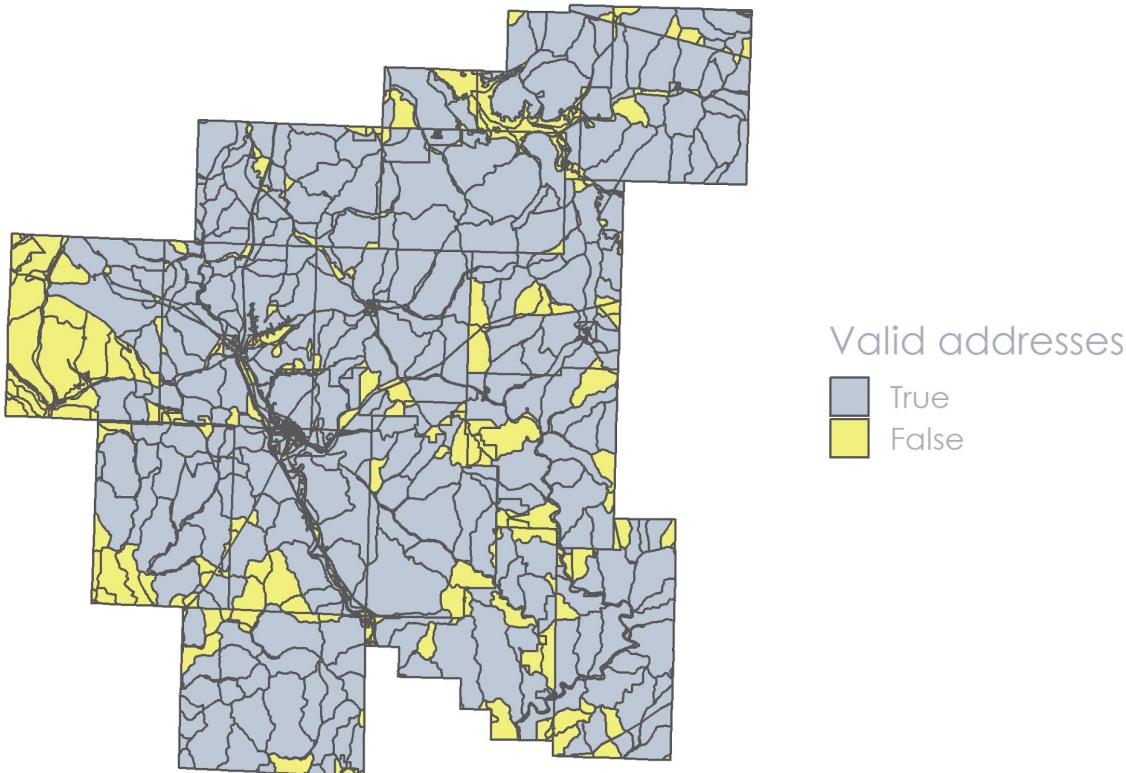
Photo courtesy of David Cater

Geocoding addresses



```
map_chr(1:nrow(noble), function(i) tigris::call_geolocator(noble[['RESIDENTIAL_ADDRESS1']][i],  
noble[['RESIDENTIAL_CITY']][i],  
noble[['RESIDENTIAL_STATE']][i]))
```

Blocks with no valid addresses



Classifying blocks with precinct names

```
library(tidyverse)
library(tigris)
library(sf)

blocks <- blocks(state = "oh", county = "noble") %>%
  st_as_sf()

noble_nn <- noble %>%
  join_voters_to_blocks() %>%
  find_neighbors(type = "rook") %%
  lookup_precinct_names_nn() %>%
  classify_nn()

## There are 1013 unclassified blocks.
```

```
● ● ●

noble_nn2 <- noble_nn %>%
  lookup_precincts_nn() %>%
  classify_nn()

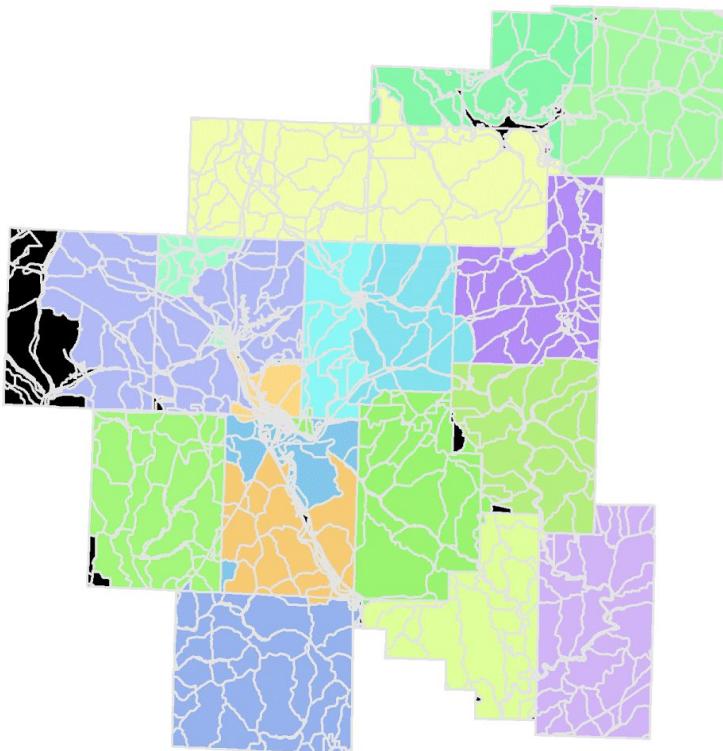
## There are 208 unclassified blocks.

# Continue this until you have 0 unclassified precincts

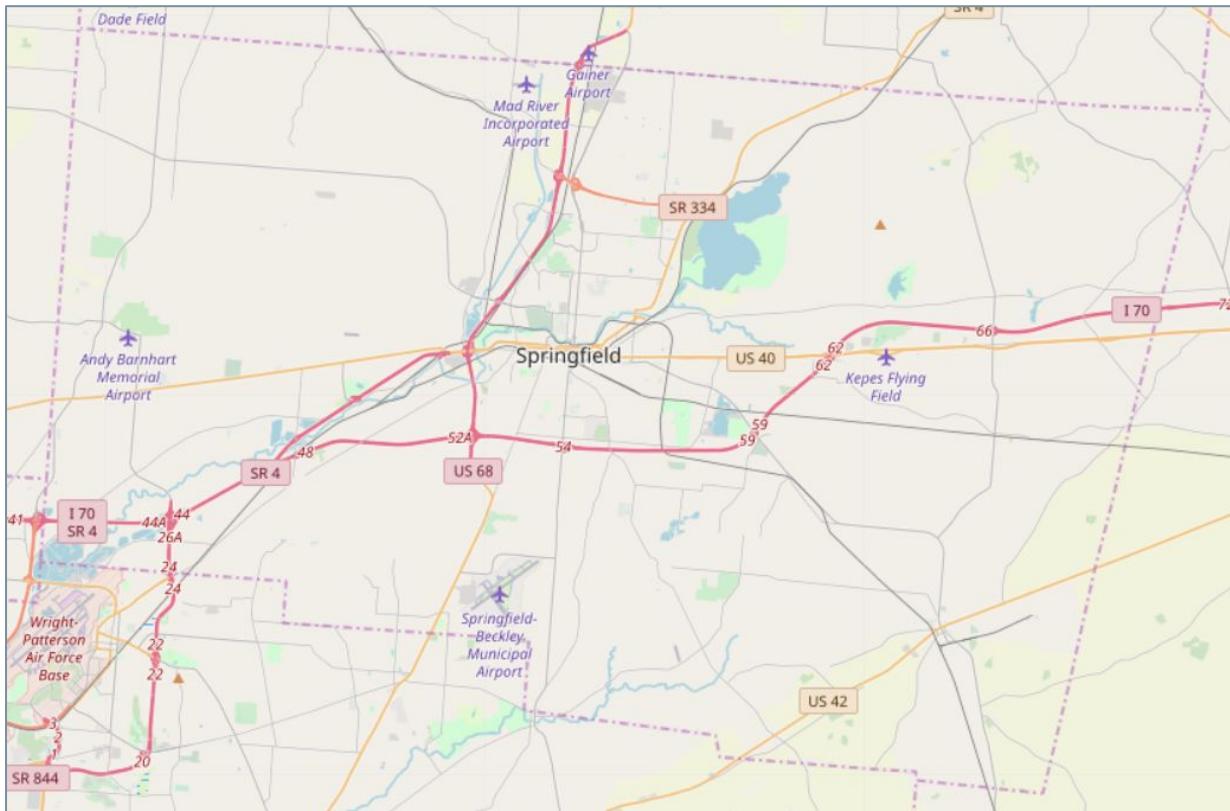
noble_nn7 <- noble_nn6 %>%
  lookup_precincts_nn() %>%
  classify_nn()

## There are 0 unclassified blocks.
```

Precinct classifications after one iteration in Noble County, OH



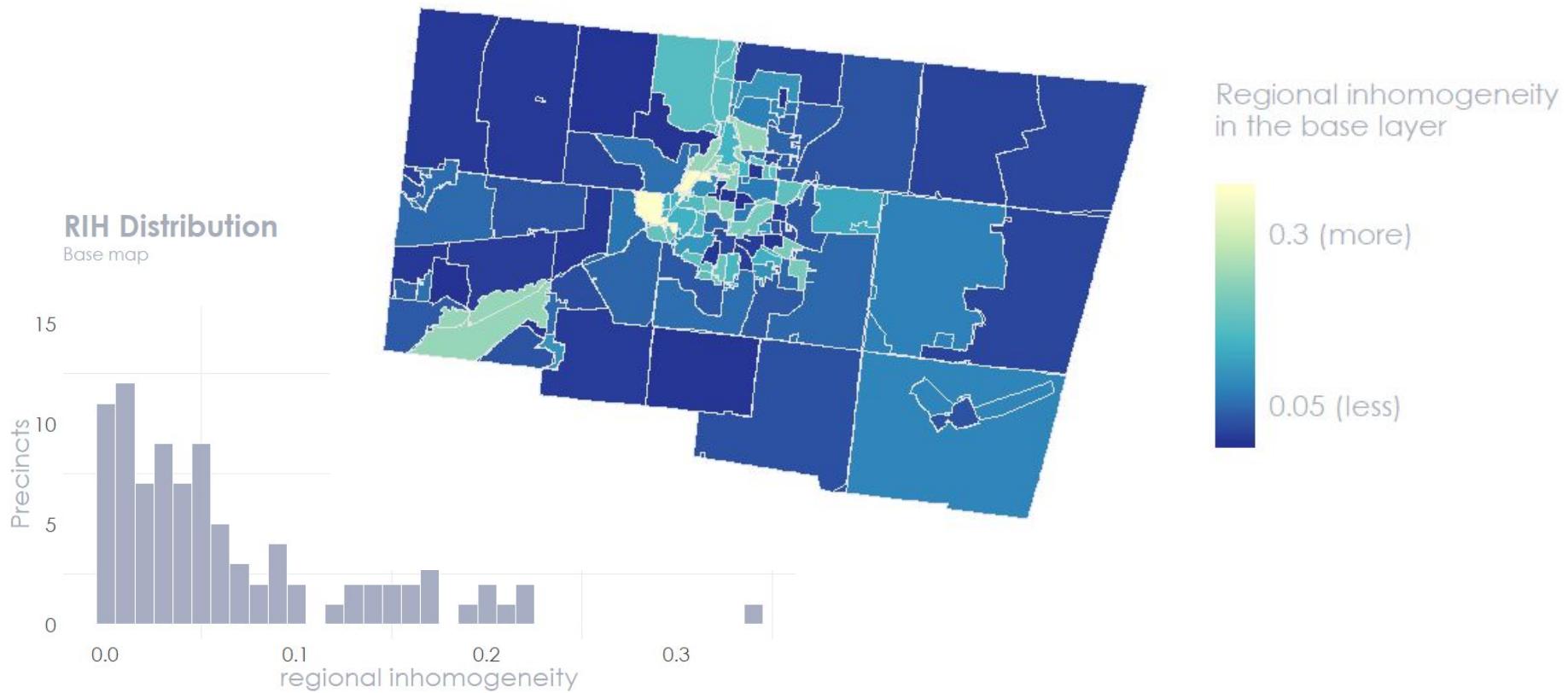
Clark County



Map from
OpenStreetMap

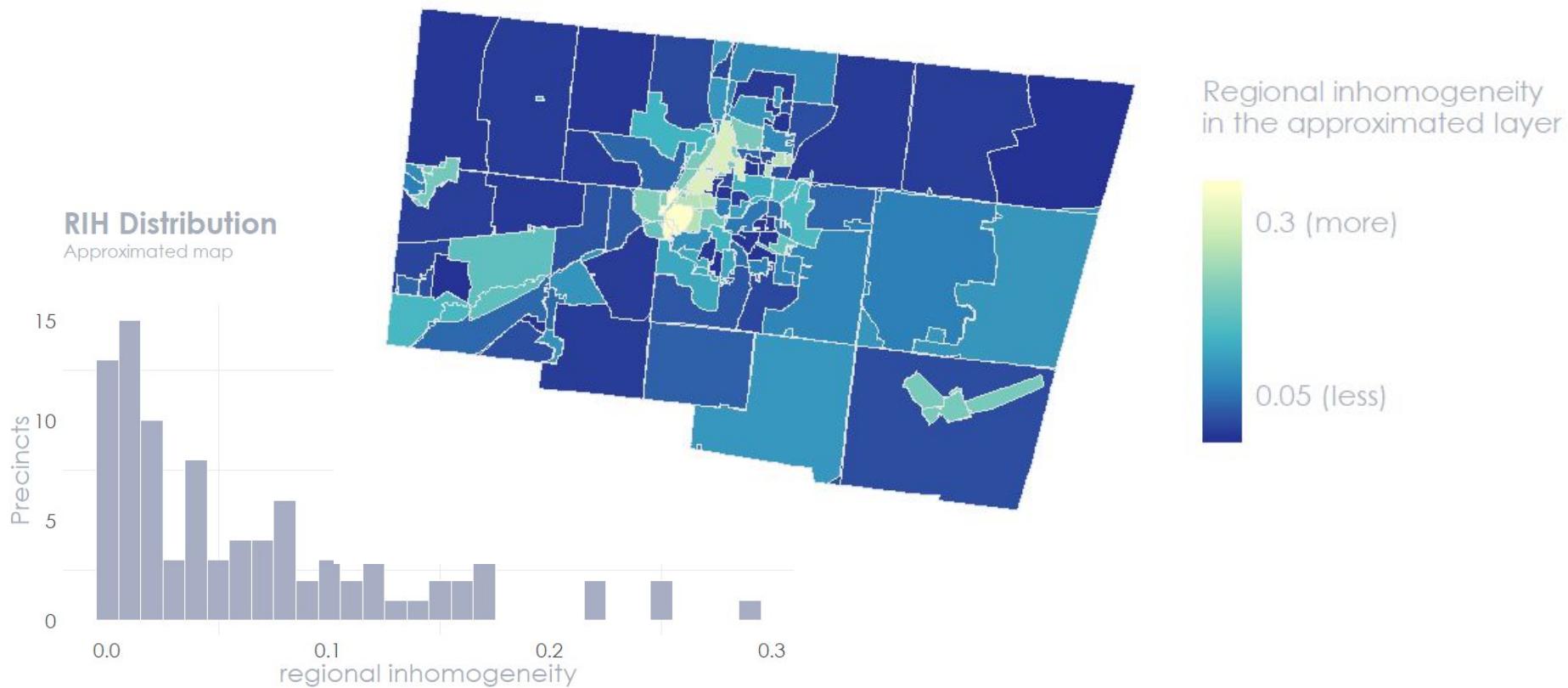
Regional inhomogeneity in Clark County measured by the information-theoretical V-measure

Comparing the base map to the approximated map



Regional inhomogeneity in Clark County measured by the information-theoretical V-measure

Comparing the approximated map to the base map



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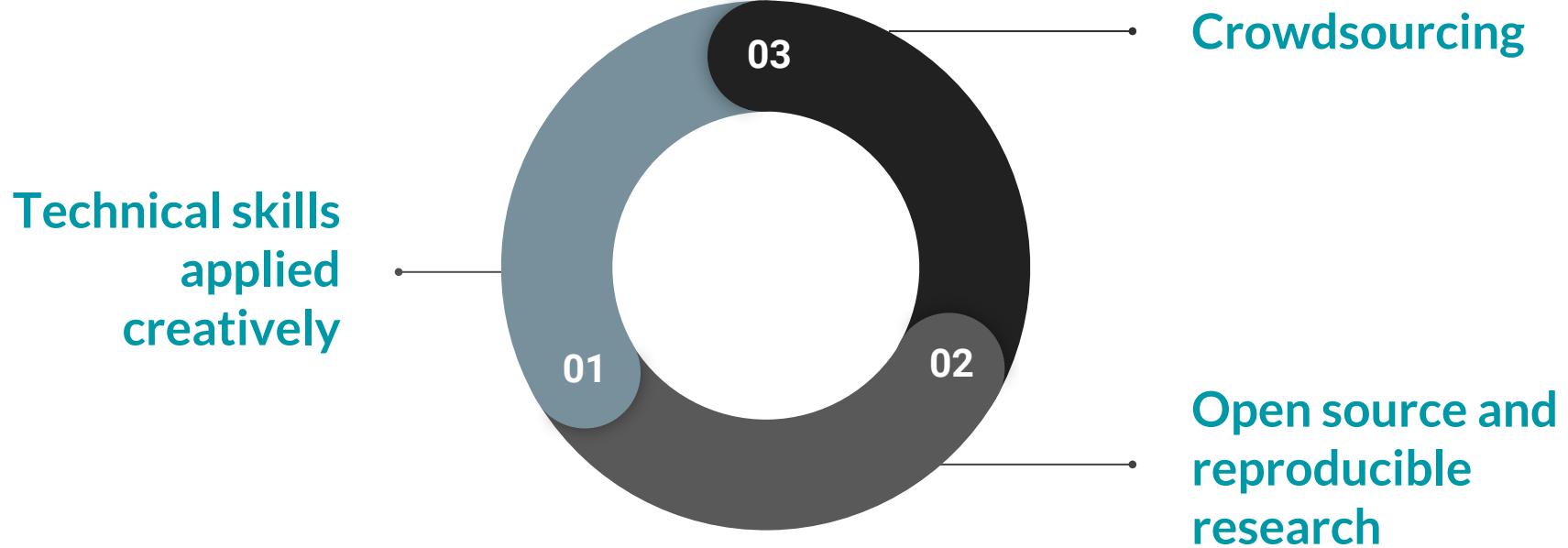
Creating a lookup table for precinct names

PRECINCT_shp	COUNTYGEOID1	COUNTYNAME1	PRECINCT_election_results	PRECINCTCODE_	PRECINCT_misfit	
Bratton Township	39001	Adams	BRATTON TOWNSHIP	AAA		
Brush Creek Township	39001	Adams	BRUSH CREEK TOWNSHIP	AAB		
Green Township	39001	Adams	GREEN TOWNSHIP	AAE		
Jefferson Township	39001	Adams	JEFFERSON TOWNSHIP	AAG		
Liberty Township	39001	Adams			LIBERTY NORTH, ABI, LIBERTY SOUTH, AAI	
Locust Grove	39001	Adams	LOCUST GROVE	AAD		
Manchester United Township	39001	Adams	MANCHESTER UNITED TOWNSHIP	AAK		
Meigs Township	39001	Adams	MEIGS TOWNSHIP	AAN		
Monroe Township	39001	Adams	MONROE TOWNSHIP	AAR		
Oliver Township	39001	Adams	OLIVER TOWNSHIP	AAS		
Peebles Village	39001	Adams			PEEBLES EAST, AAP, PEEBLES WEST, AAQ	
Scott Township	39001	Adams	SCOTT TOWNSHIP	AAT		
Seaman Village	39001	Adams	SEAMAN VILLAGE	AAU		
Sprigg Township	39001	Adams	SPRIGG TOWNSHIP	AAW		
Tiffin East	39001	Adams	TIFFIN EAST	AAY		
Tiffin West	39001	Adams	TIFFIN WEST	AAZ		
Wayne Township	39001	Adams	WAYNE TOWNSHIP	ABE		
West Union A	39001	Adams	WEST UNION A	ABA		
West Union B	39001	Adams	WEST UNION B	ABC		
Winchester Township	39001	Adams	WINCHESTER TOWNSHIP	ABG		
Winchester Village	39001	Adams	WINCHESTER VILLAGE	ABH		
Delphos 2B	39003	Allen	DELPHOS 2B	AAG		

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Thoughts we had throughout the project



Contact us with questions or comments



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Katya Kelly

kellykat203@gmail.com

And visit <https://tinyurl.com/kjolly-gislis> for resources from this presentation!