data

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outline

regular (not gis) data: xls, csv, etc

gis data (has shapes, can make a map from it): shp, kml, etc

Notebook: dive into thematic/choloropleth maps

join/merge

Notebook: join/merge

DATA SOURCES

see examples in notebook

ex from past

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what are data?

- u/a: unit of analysis: what do you study?
- u/a=# of obs=# of rows=sample size
  - dataset has variables, which are the *attributes* of u/as
- say students: age; counties: water area
- cols=vars, rows=obs; vars characteristics of obs
- if several layers: may have several u/as
- eg counties: #18; hospitals:#700; ex of attr?
- dataset is a matrix/spreadsheet/2D object

storage type: num v str

- strings are safer; eg string "0821" made into a number results in "821", which is a mistake !
  - that's why software, incl qgis often store num as str
  - but then often need to make str into num to do the math/map
- be careful about it, triple check, there are often problems and it's non-intuitive

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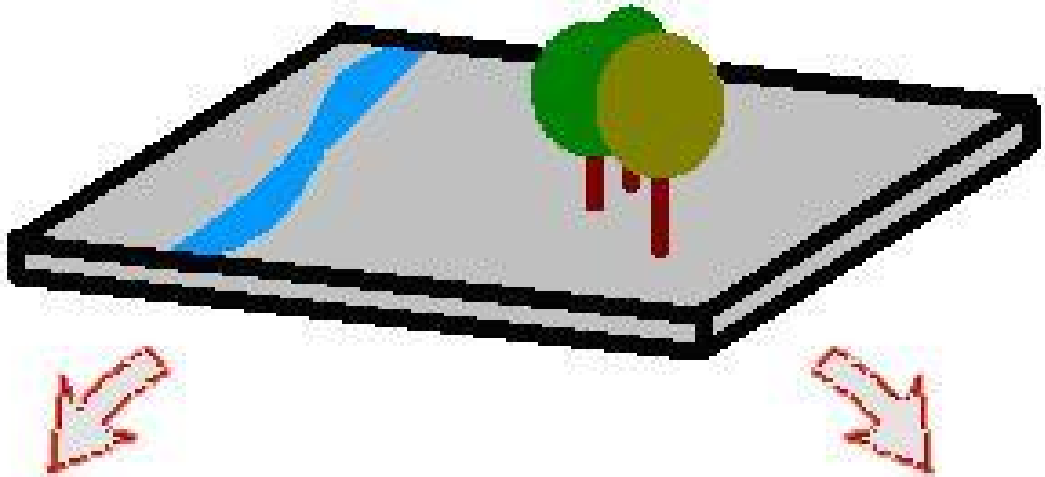
files

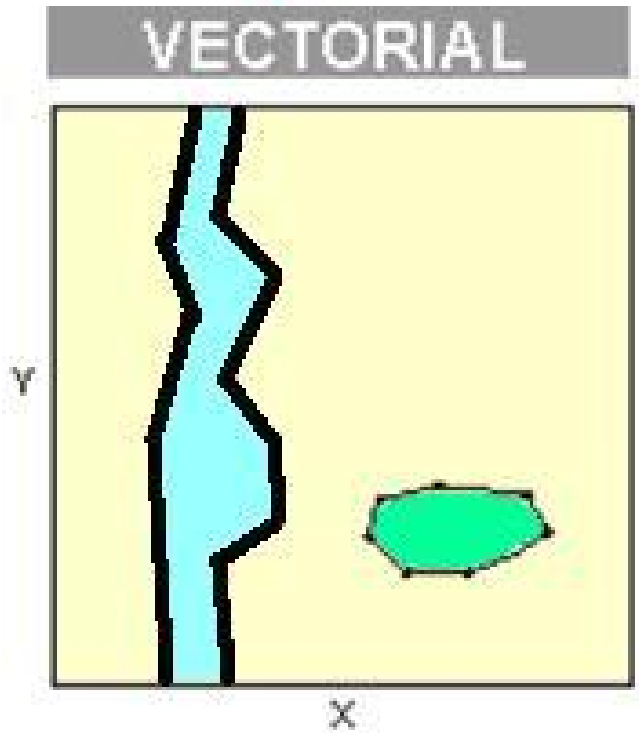
- .shp (along with bunch of others)
- .kml
- and other
  - we'll cover them on "as is" basis
  - if you bump into something weird, email listserv

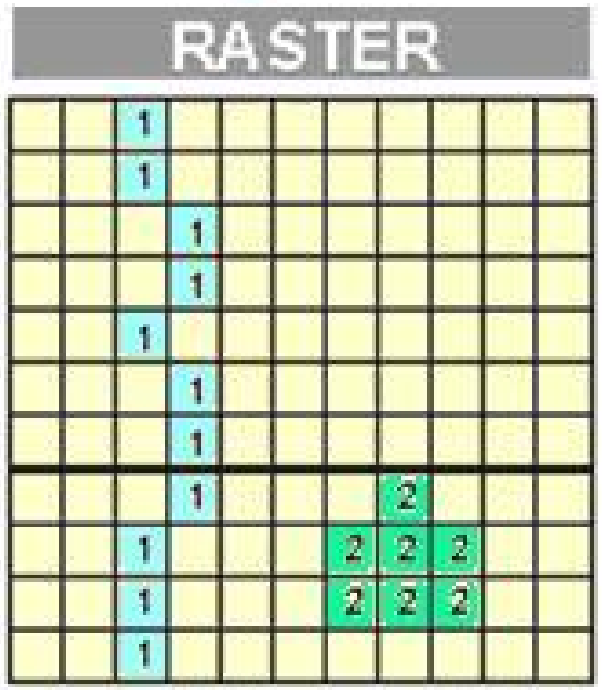
raster (picture) v vector (point, line, or polygon)

- raster (has resolution)
  - area covered by cells/pixels
  - each cell/pixel have values/colors
- vector (no resolution): all real world features:
  - points (dots/nodes): airports, cities, trees
  - lines (arcs): rivers, roads
  - polygons (areas): counties, cities

raster and vector







gis data as layers of shapes with regular data

- data are organized by *layers*, eg roads, admin boundaries, etc; show example/draw a picture
- each layer: loc info (shapes)+often some regular data
  - ie data table with loc info (shapes) must underlie a map
  - (the data table often has some regular data, too)
- often you want to produce thematic (choropleth) maps
  - thematic maps use different symbols/colors (themes) to show variation in regular data

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some real skills

- this is where the real value come from:
  - to bring different vars together to produce new insight
- if you just map vars from same or similar data:
  - it has probably already been done!
  - just goog: "what you study, map" and see images
- but combining creatively variety of vars:
  - there is no such map in the world!
- eg `https://scholarship.libraries.rutgers.edu/view/delivery/01RUT_INST/12643382240004646/13643522850004646`

howto map regular (eg xls) data?

- it would likely have geo id:
  - hospital name/code, county name/id, etc
  - codes/ids are great: unique! (as opposed to names)
  - then google a shapefile that you can join with your data
- google "geo in you data, shapefile"
  - eg "NJ counties, shapefile"
- and then join the two to produce a map

"the join problems": examples

- "Camden county" $\neq$ "Camden"
- "Congo" $\neq$ "Congo, Republic of"
- "Great Britain" $\neq$ "United Kingdom"
- "Camden" $\neq$ "CAMDEN"
- "Camden " $\neq$ "Camden" (space is a character !)
- "08012" $\neq$ "8012"
- be very careful; check the tables to see if it merged right
- does it make sense? eg Camden richer than Cherry Hill?

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don't trust anybody! neither yourself

- remember, always be critical
- triangulate your results: compare with other source
  - just goog picture, eg 'nj counties property values map'
  - looks about right
  - (other definition of the prices, but correlation is important)
- show to others, ask for comments

triple check

- merging (joining) data is tedious and tricky
- be careful, double, triple check
- easy to make mistake

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data management takes time! value your time!

- producing maps fast; data management 50-95% of time
  - figuring out, understanding, cleaning, documenting, combining, etc
- so we start with data management like join/merge
- spend it on data you care about and will use in your career!
- think hard about data you'll use in your career
- otherwhise you'll waste 100+ hours !!!

data ideas

- camden county https://camdencountynj-ccdpw.opendata.arcgis.com/search?collection=Dataset eg camden zoning :)
- NJ https://gisdata-njdep.opendata.arcgis.com
- Philly https://www.opendataphilly.org
- a lot!: http://geocommons.com/search.html
  - just search for what you are interested in, say 'road'
- https://www.policymap.com/maps
  - $ to downld data, but click 'Source' and download by hand
- open gov, especially city data, just few examples
- https://data.cityofchicago.org/ , http://opencityapps.org/ , http://www.opendataphilly.org/ , http://www.phila.gov/data/Pages/data.aspx

data ideas

- https://tax1.co.monmouth.nj.us/cgi-bin/prc6.cgi?menu=index&ms_user=monm&passwd=data&district=1301&mode=11
  - can pick 'advanced srch' to srch say 'vacant'
  - and 'output format' excel
- NJ parcels https://njgin.nj.gov/njgin/edata/parcels/#!/
  - https://www.njmap2.com/parcels/parcels/
  - https://www.arcgis.com/apps/webappviewer/index.html?ic

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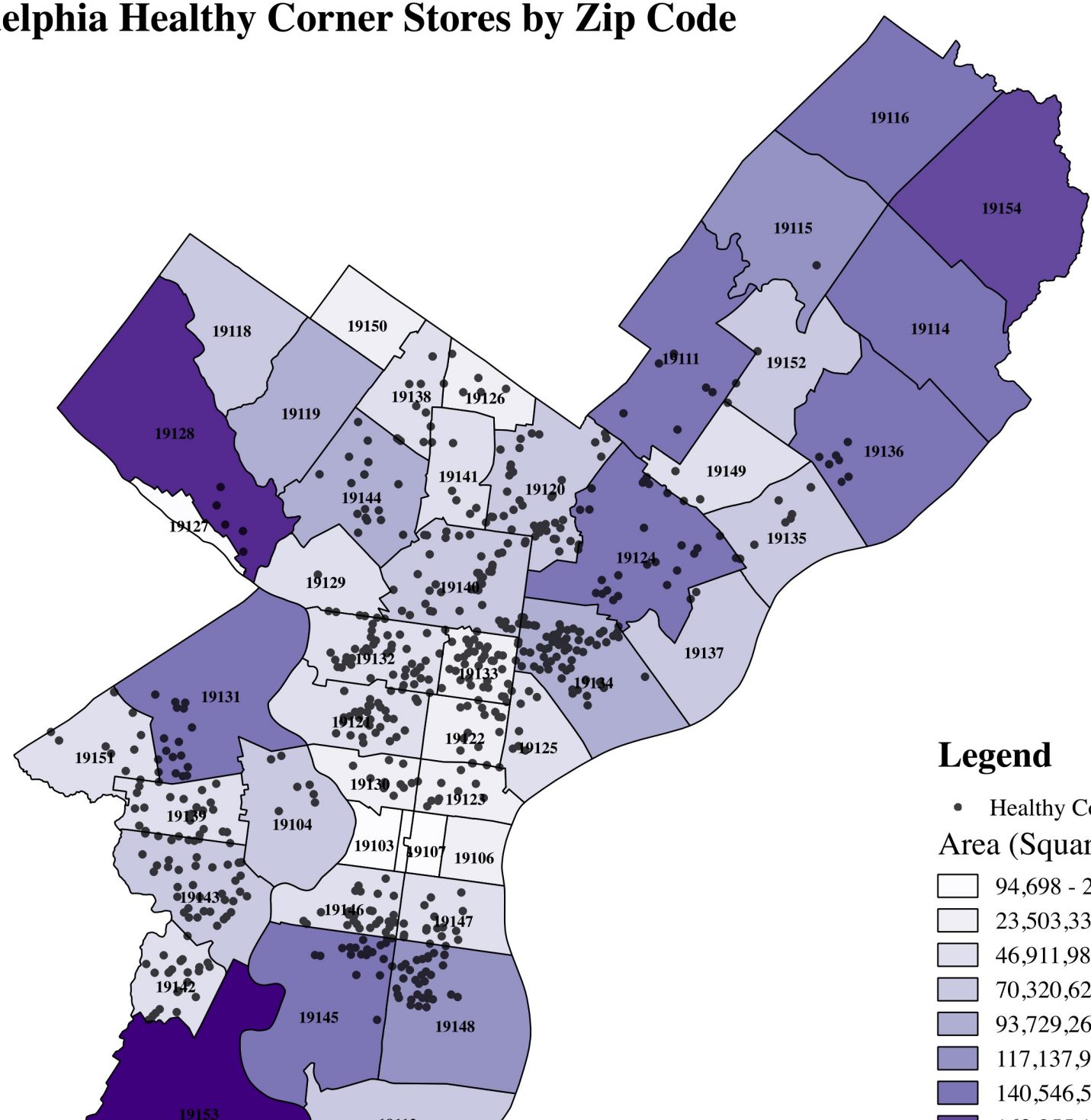
Philadelphia Healthy Corner Stores by Zip Code

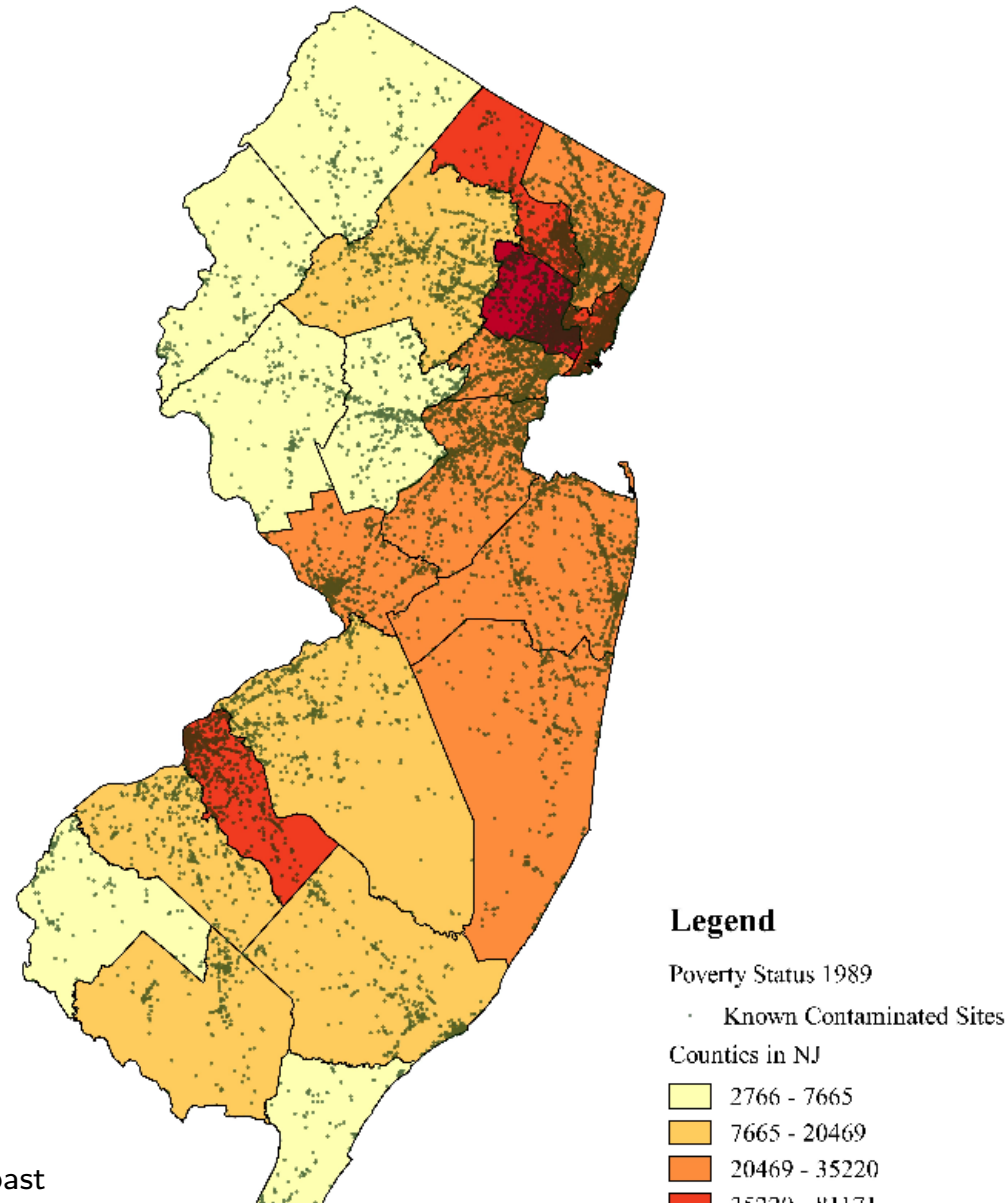


healthy corner stores

- makes sense to label zipcodes; right proportions
- these aren't sq miles! sq ft or meters!
  - colors denote polygon sizes–so same info twice
  - better could map educ, inc, age, bmi, etc
  - dots could be little smaller or hollow so they overlap less
- make goog map and zoom in: show more detail

  see environ: other businesses, pub transpo, sch, etc
- wonder about big healthy stores like wholefoods
  - could dentote big ones with big dots
- usually may want to put year on a map

Contaminations Sites in New Jersey 1992



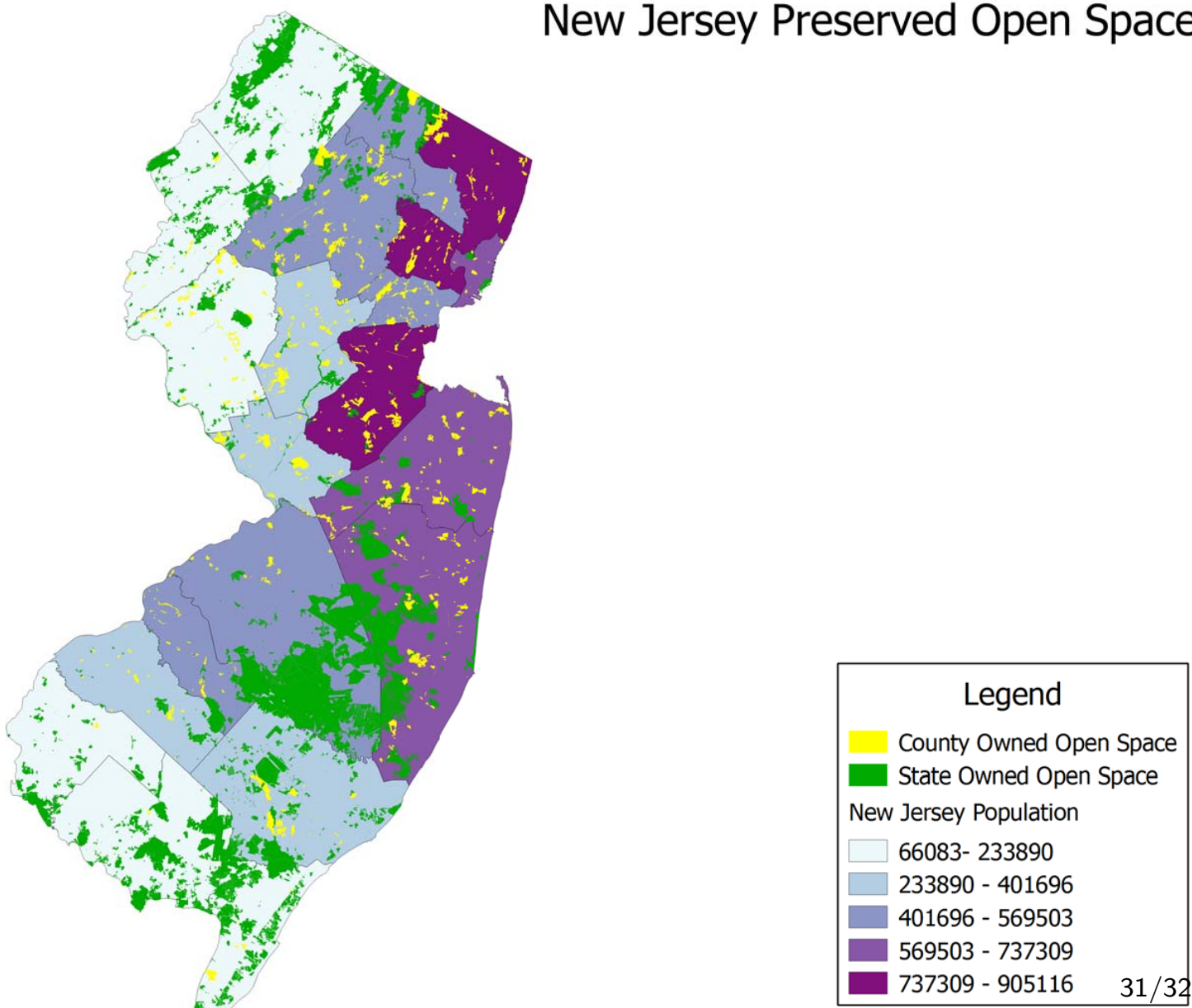
contaminations

- perfect size and color for contaminated sites!
  - doesn't overlap much but big enough to see
  - and grayish good for contamination
- informative– NYC and Philly the worst
- excellent idea to relate poverty to contamination
  - there is lit linking them! so nice test! [also can do race]
  - could do poverty at municipal or census tract levels
- use space better! NJ should be bigger like Philly stores
- thousands must be set off by commas in legend
- very good to match contaminations and poverty by year!
- "poverty status"–guess counts; better %
- as in Philly map: zoom to Camden, have goog map in back

contaminations

- http://www.nytimes.com/interactive/2015/07/08/us/census-race-map.html?_r=0
- in couple classes we'll be making online maps like this
- but already now you can do sth similar
  - see footnote: census and socialexplorer.com: download data
- map in qgis and bring in background from googmaps
  - with openlayers plugin

open space



ex from past

open space

- excellent idea for map–open space related to population
- great use of multiple layers
- great non-cluttered borders
- can use space better-portrait orientation, bigger NJ
- use commas for population
- say for which year it is
- pop den probably more meaningful
  - on the other hand, we already see size from map
  - and so we can sort out density