Using Census Data and Mapping in Audits

Pacific Northwest Intergovernmental Audit Forum

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Oregon Audits Division

Agenda

- Objective – To learn about data sources and potential audit applications.

1. Introduce data sources
2. Introduce tools
3. Audit applications
4. Apply knowledge

Census Data

- What information is available
- Why should I use it
- What value can it add

Demographic Surveys

- Decennial Census
- American Community Survey
  - 1-, 3- and 5- year estimates
  - Formerly the “long form” of the census
- American Housing Survey
  - Detailed housing data
- Current Population Survey
  - Economic & Labor Force data

Other Sources of Data

- Bureau of Labor Statistics
  - Inflation Calculator
- Bureau of Transportation Statistics
- Department of Housing and Urban Development
- National Center for Education Statistics
- National Center for Health Statistics

Other Sources of Data (Cont.)

- Social Security Administration
  - Death Master File
- Office of Economic Analysis
  - Economic Forecast
  - Revenue Forecast
  - Demographic Forecast
  - Corrections Forecast
- DAS Geospatial Enterprise Office
- Portland State Population Research Center

Census Geography

- Census data is divided into several geographic areas
  - Census block
  - Census tract
  - Census place
  - County
  - State

Tools Overview

- Census
  - Free, but difficult to use and learn
  - FactFinder
  - Census Explorer
- Social Explorer
  - Easy to use tool, inexpensive
- ArcGIS
  - Powerful, but can be difficult to learn, expensive

Accessing Data & Tools

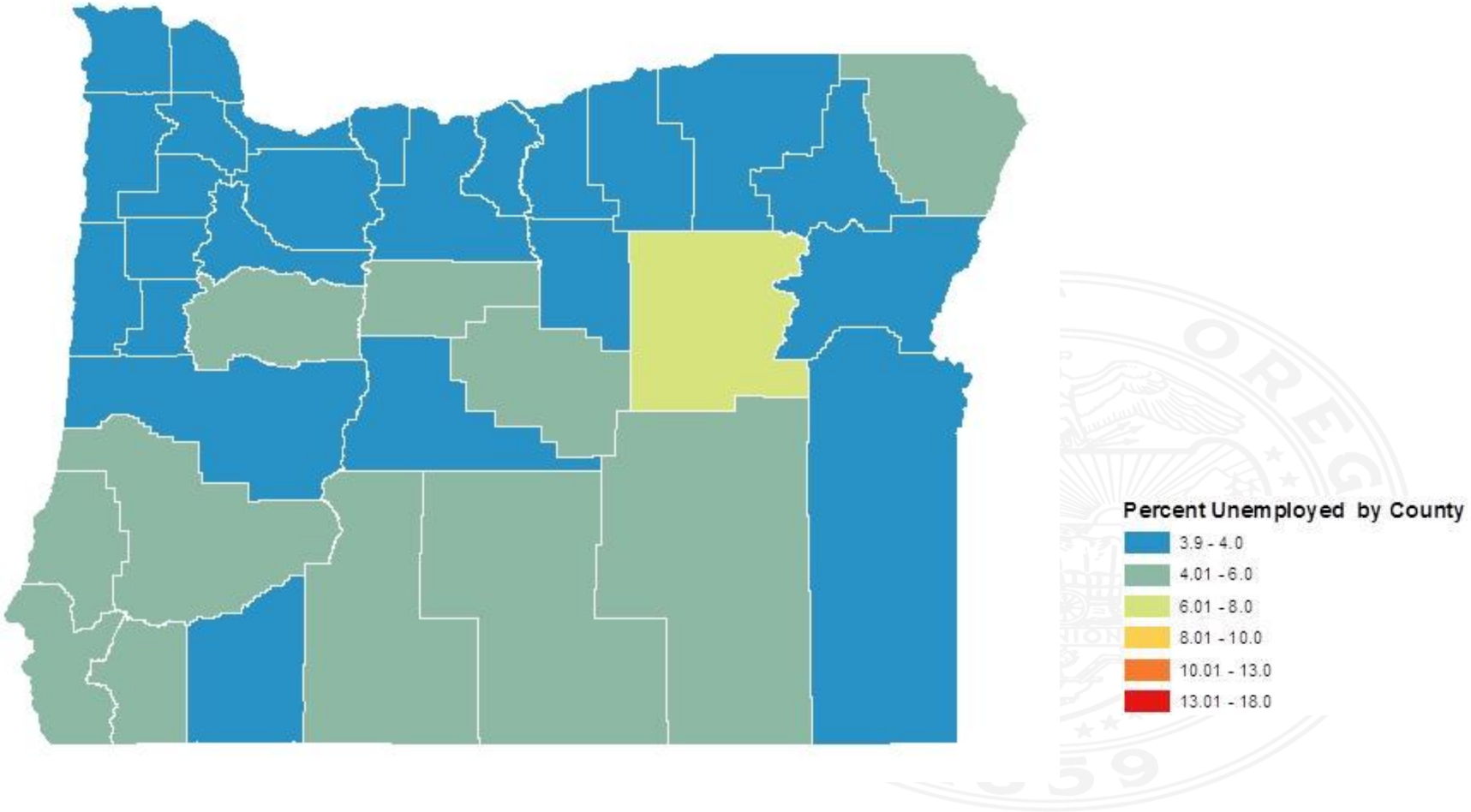
- Tiger
  - Reference maps
  - “Shapefiles”
  - Needed for ArcGIS
- Factfinder
- Social Explorer

Videos

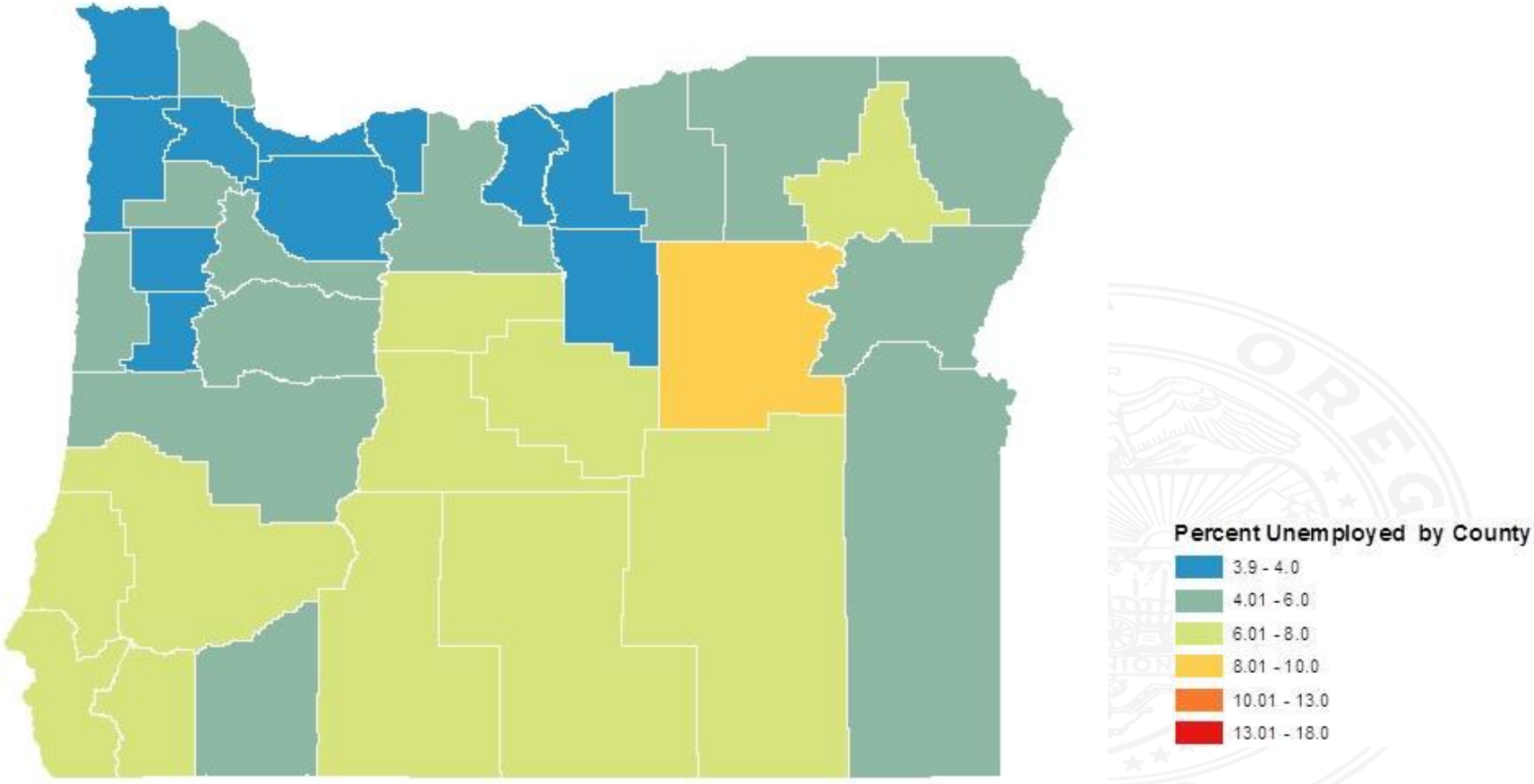
- GIS
- http://www.youtube.com/watch?v=6AlH5TvFoLw

- Social Explorer
- http://www.youtube.com/watch?v=sJfh7h1IpjY

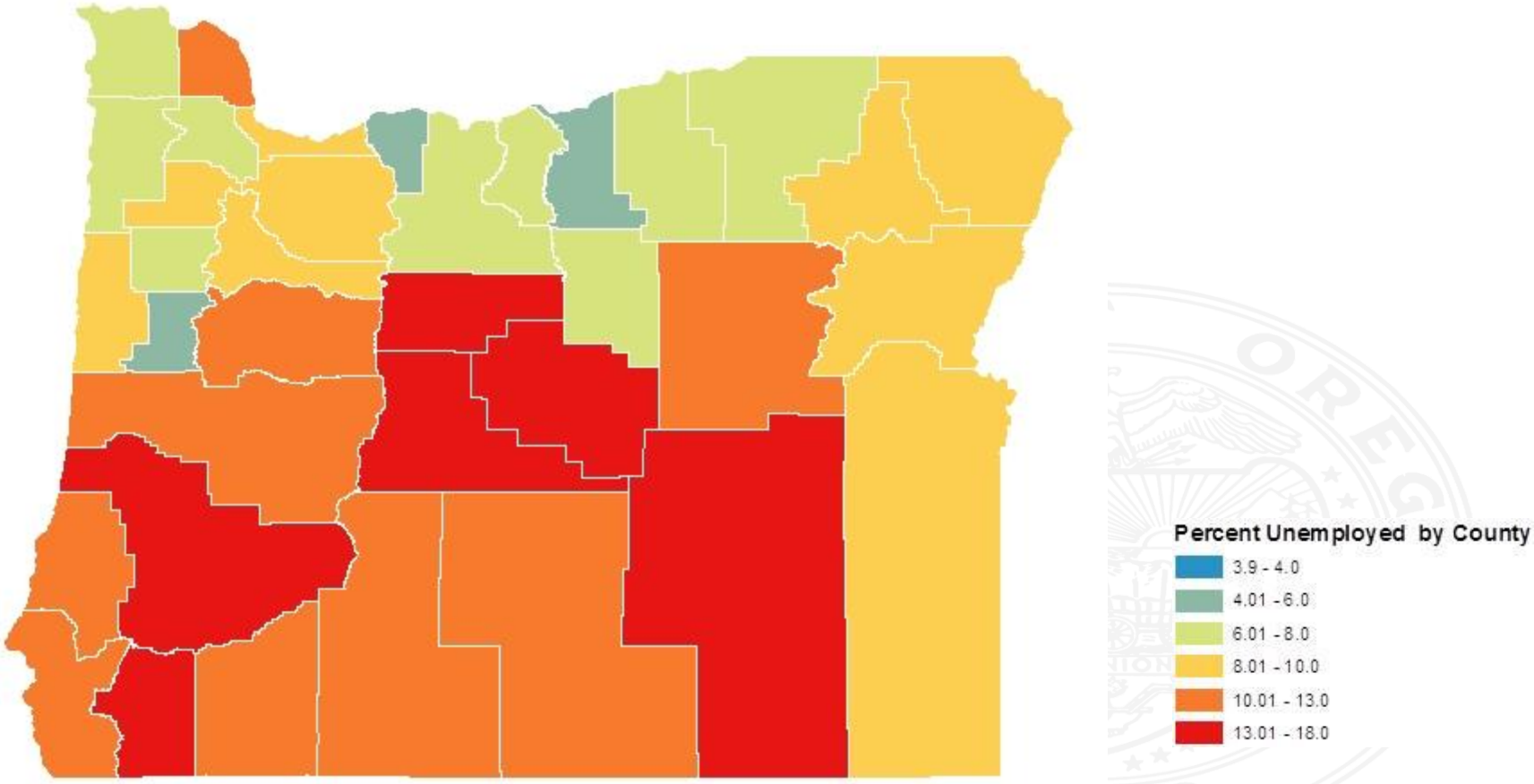
Tell a story - 2007



2008


Percent Unemployed by County
3.9 - 4.0
4.01 - 6.0
6.01 - 8.0
8.01 - 10.0
10.01 - 13.0
13.01 - 18.0

2009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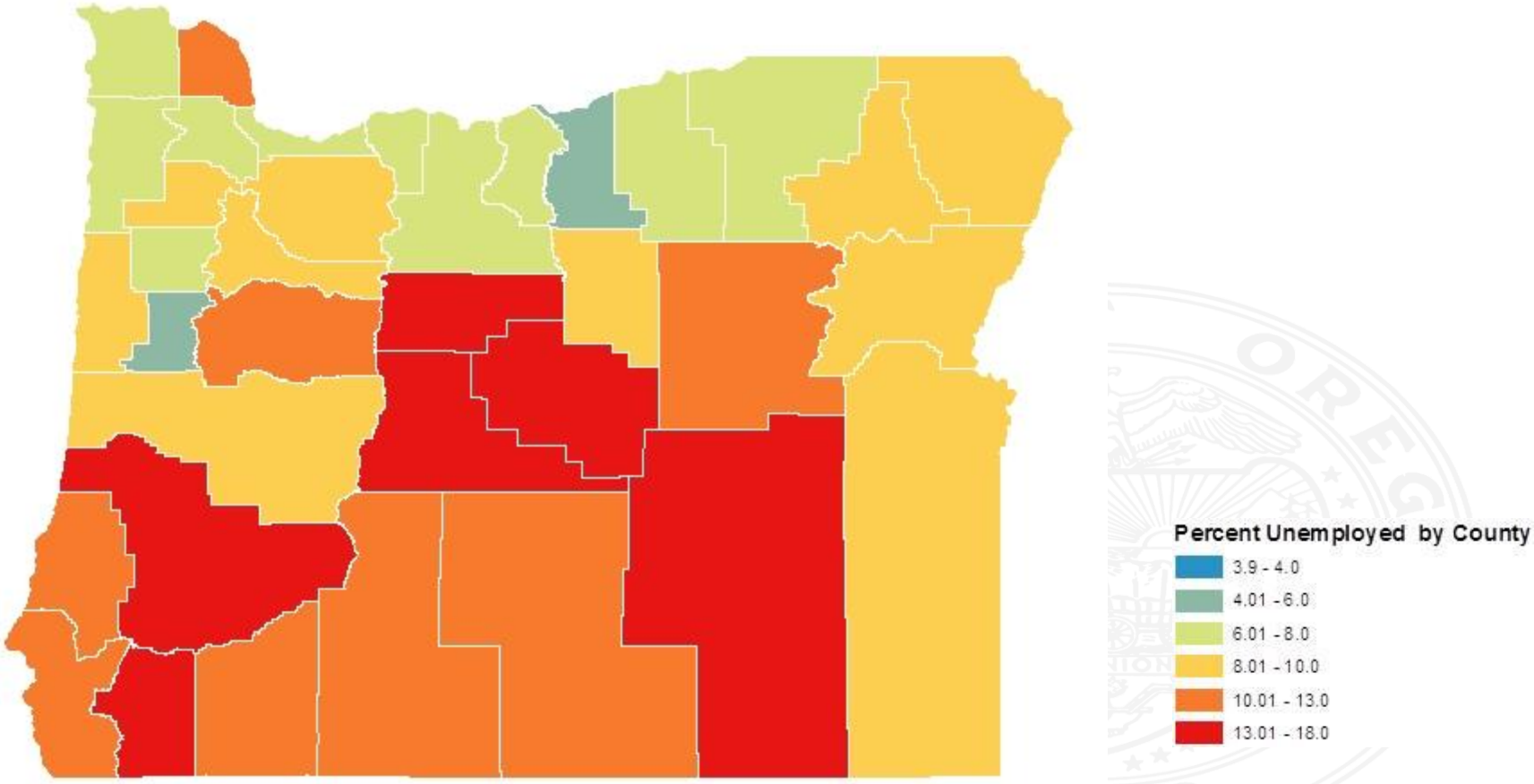
2010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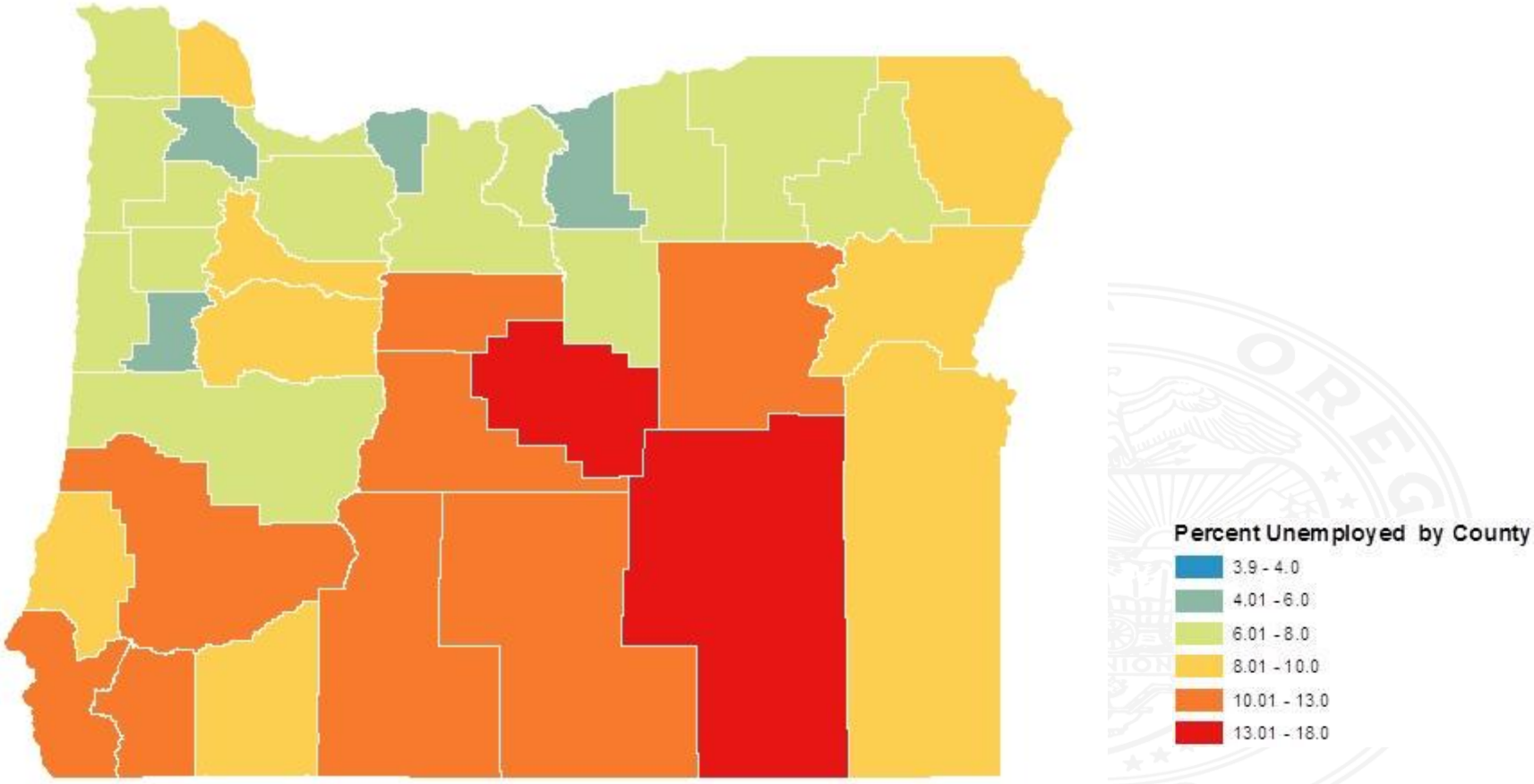
2011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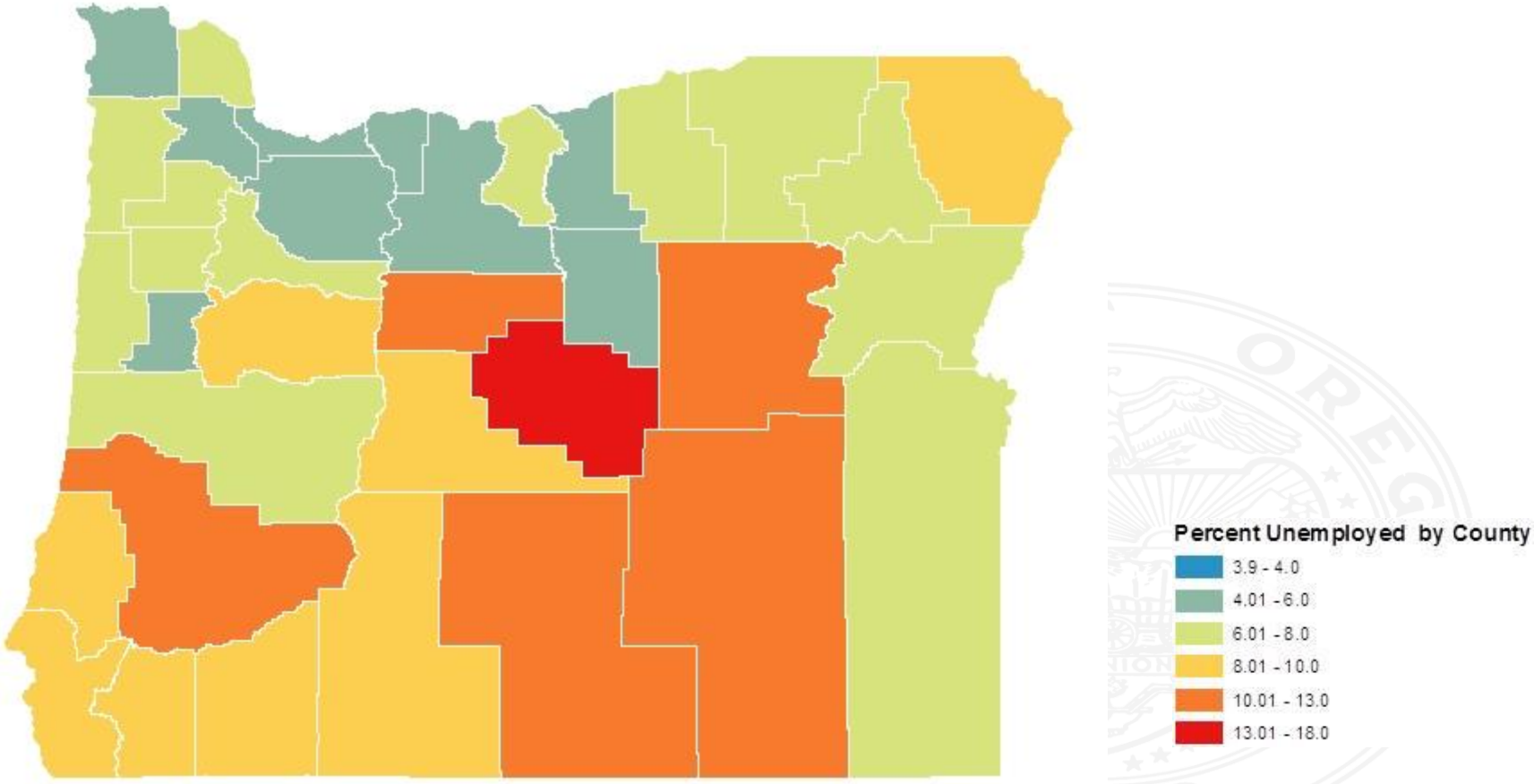
2012


Percent Unemployed by County
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10.01 - 13.0
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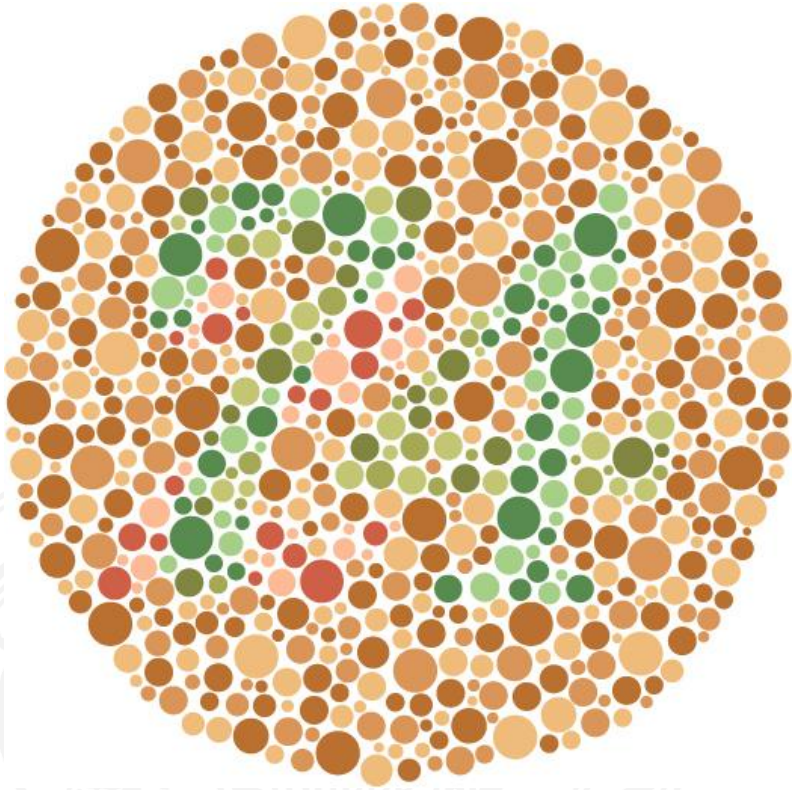
Color Considerations

- B&W Printable
- LCD compatible
- Colorblind – 15%
- Photo copy friendly



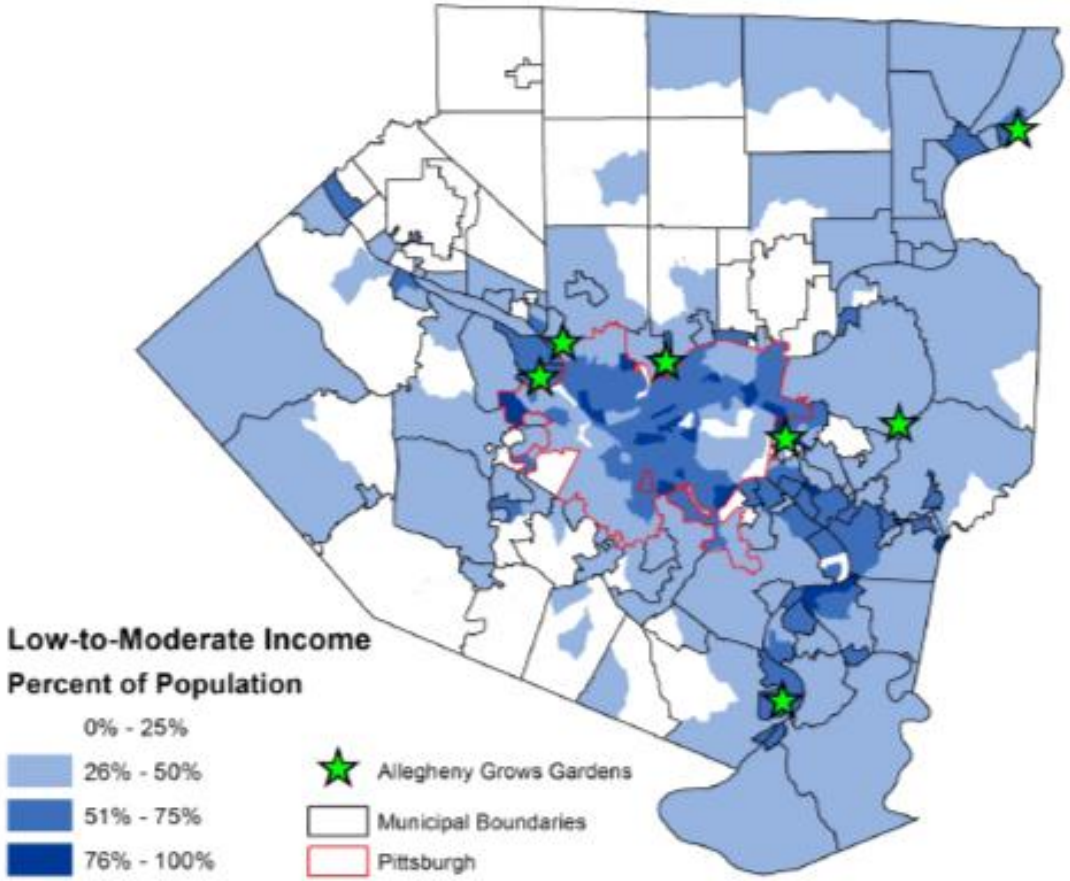
http://www.colorbrewer2.org/

http://colorschemedesigner.com/

Potential Audit Applications

- Any data source with spatial component
  - Background information
  - Fleet Services
  - Office Locations
  - Fraud Detection

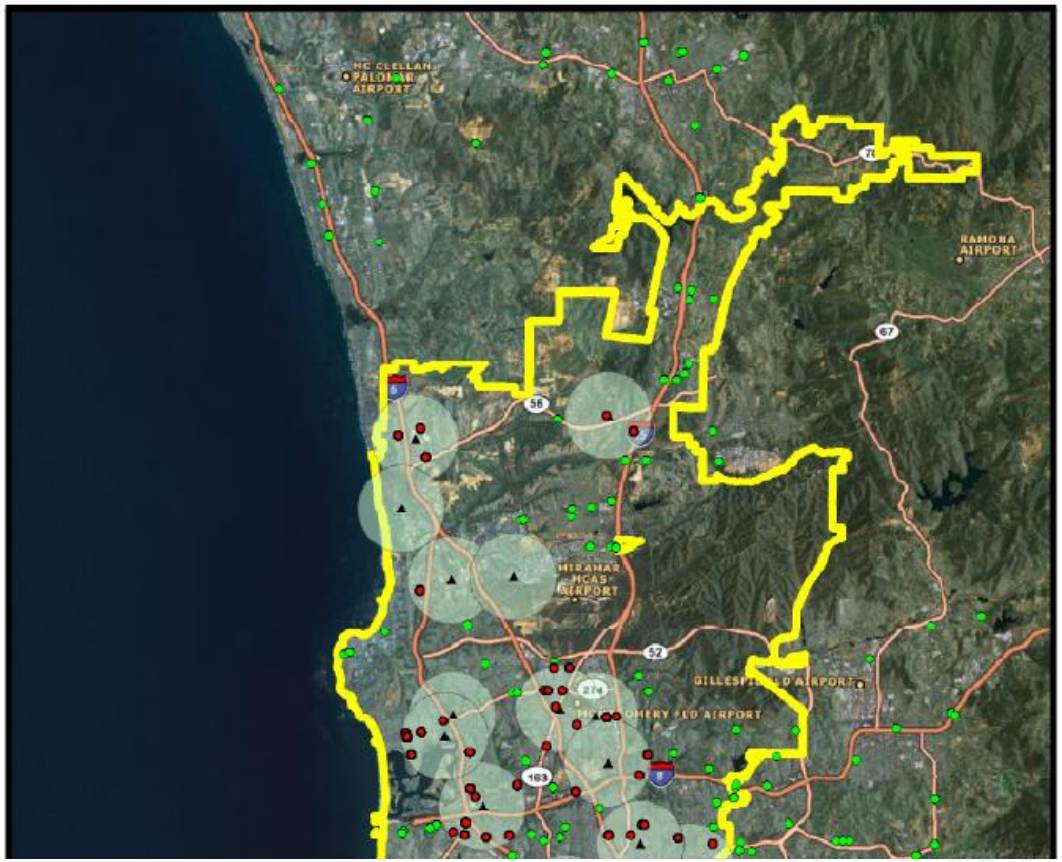
Q: Are services in the right location?



- Source: Heinz College Student Team (2012), U.S. Dept of Housing and Urban Development (2011). U.S. Census Bureau (2000). Grow Pittsburgh (2012).

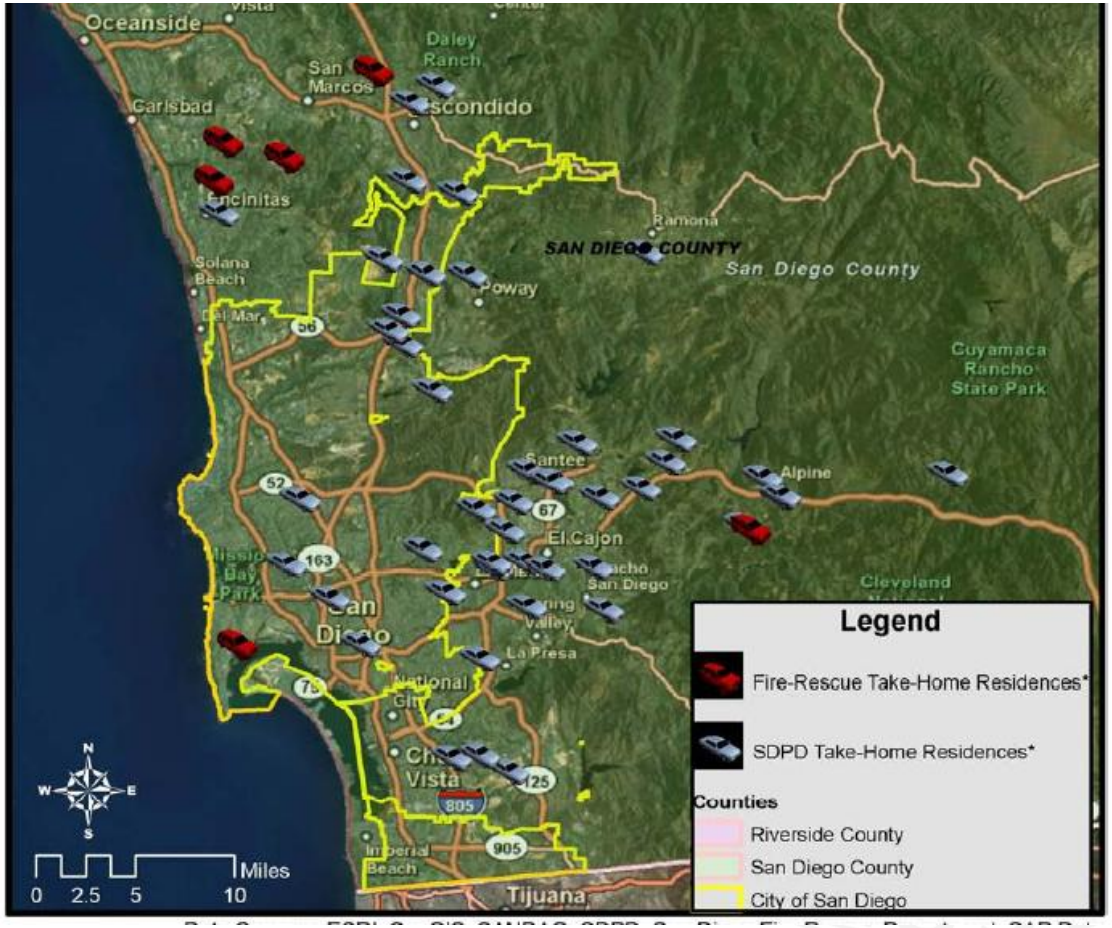
Fuel Purchases

Fuel Card Purchases Near City Fuel Sites During Fiscal Year 2010



Source: http://www.sandiego.gov/auditor/reports/fy11_pdf/audit/11-026.pdf

Take Home Vehicles

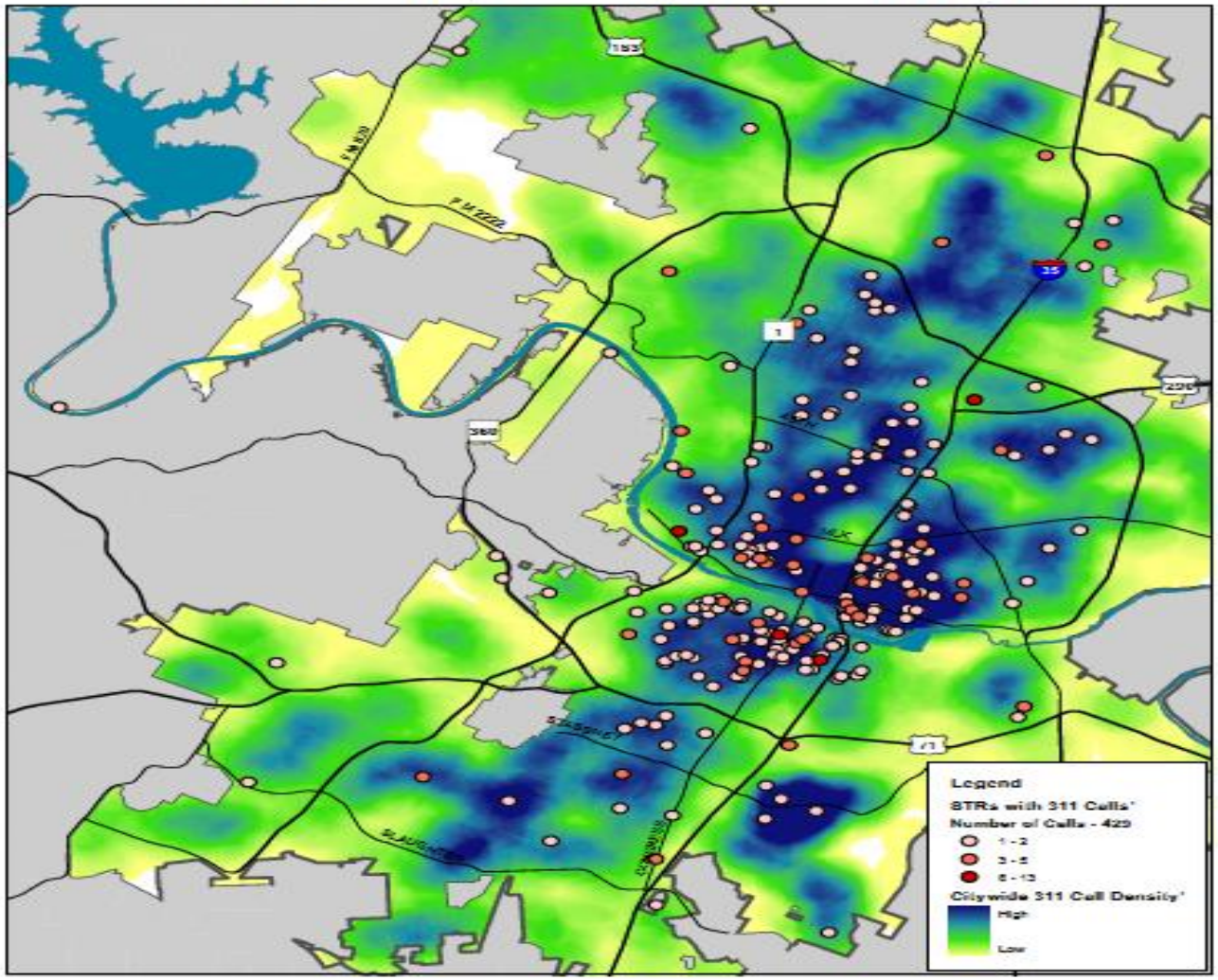


Source: http://www.sandiego.gov/auditor/reports/fy11_pdf/audit/11-026.pdf

Short-term Rentals

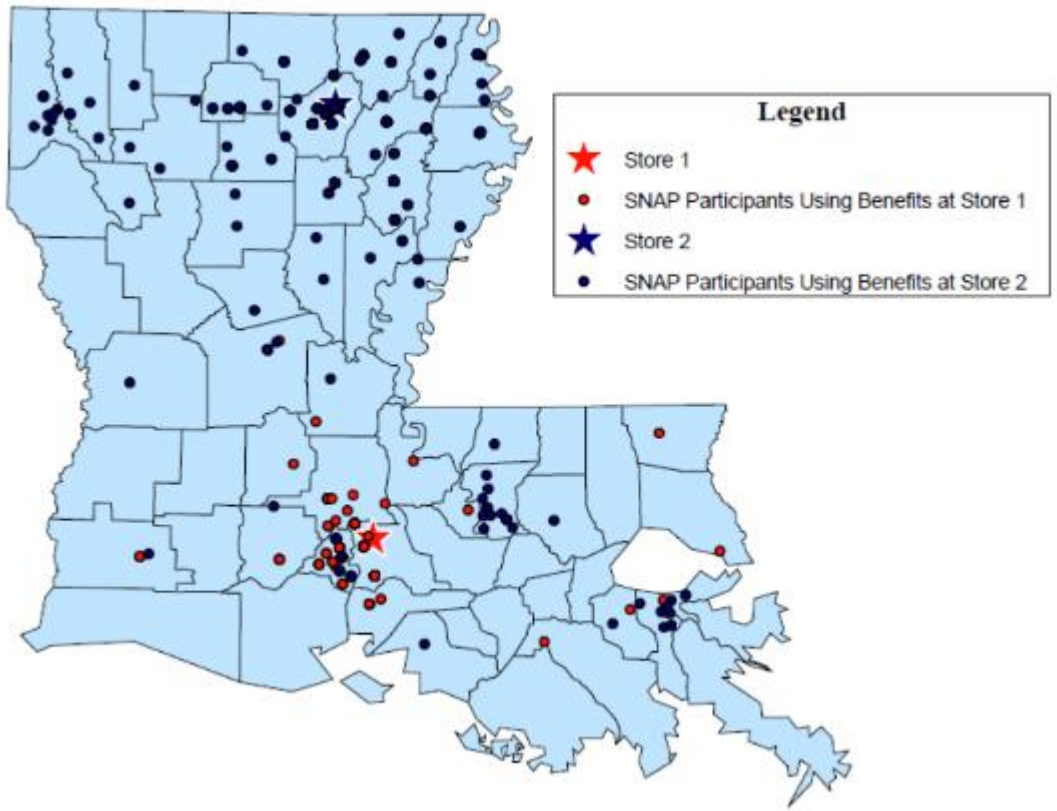
EXHIBIT 6

311 Calls* at STR Properties Compared to 311 Calls Citywide*



Source: http://www.austintexas.gov/sites/default/files/files/Auditor/au12114.pdf

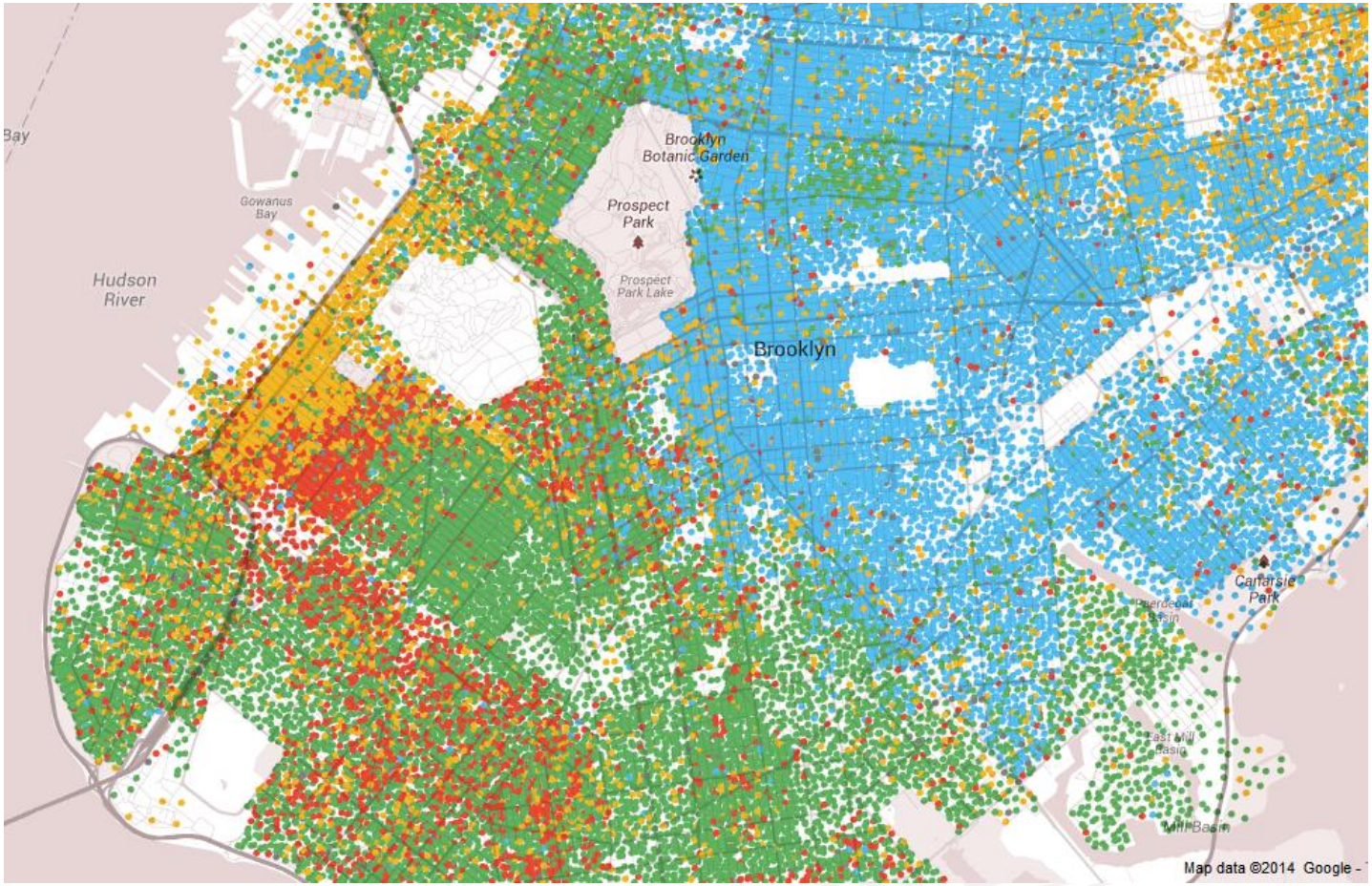
Fraud Detection



Source: http://app1.lla.state.la.us/PublicReports.nsf/60607FD8611131F786257B5E006FEF04/$FILE/000326B1.pdf

Mapping New York

Racial Segregation



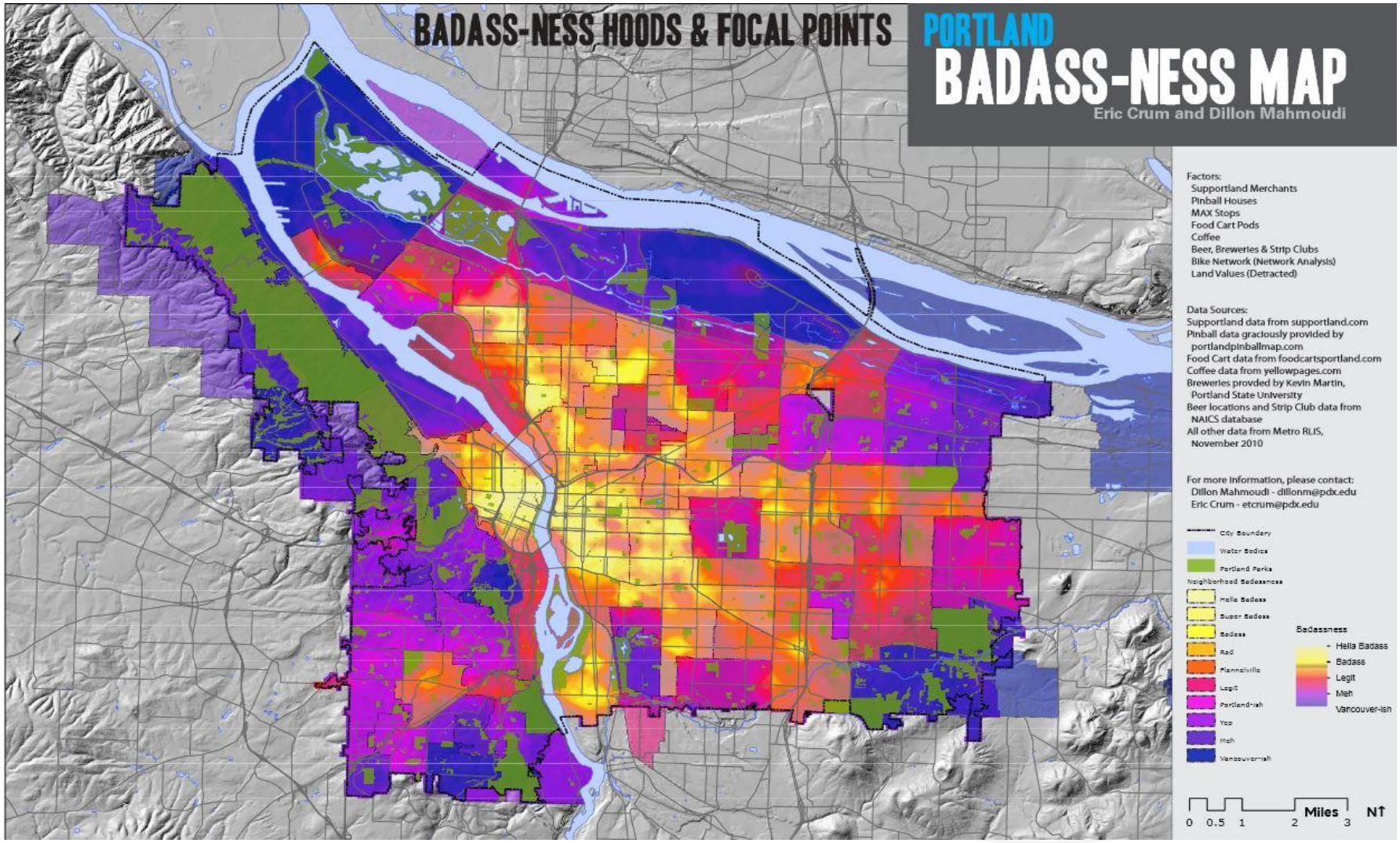
MAP KEY

One dot = 200 people

- White
- Black
- Hispanic
- Asian
- Other

Source: http://projects.nytimes.com/census/2010/explorer

Hipster's Map of Portland



Source: http://sandbox.dillonm.com/pdxbamap_finalgroup_101213.pdf

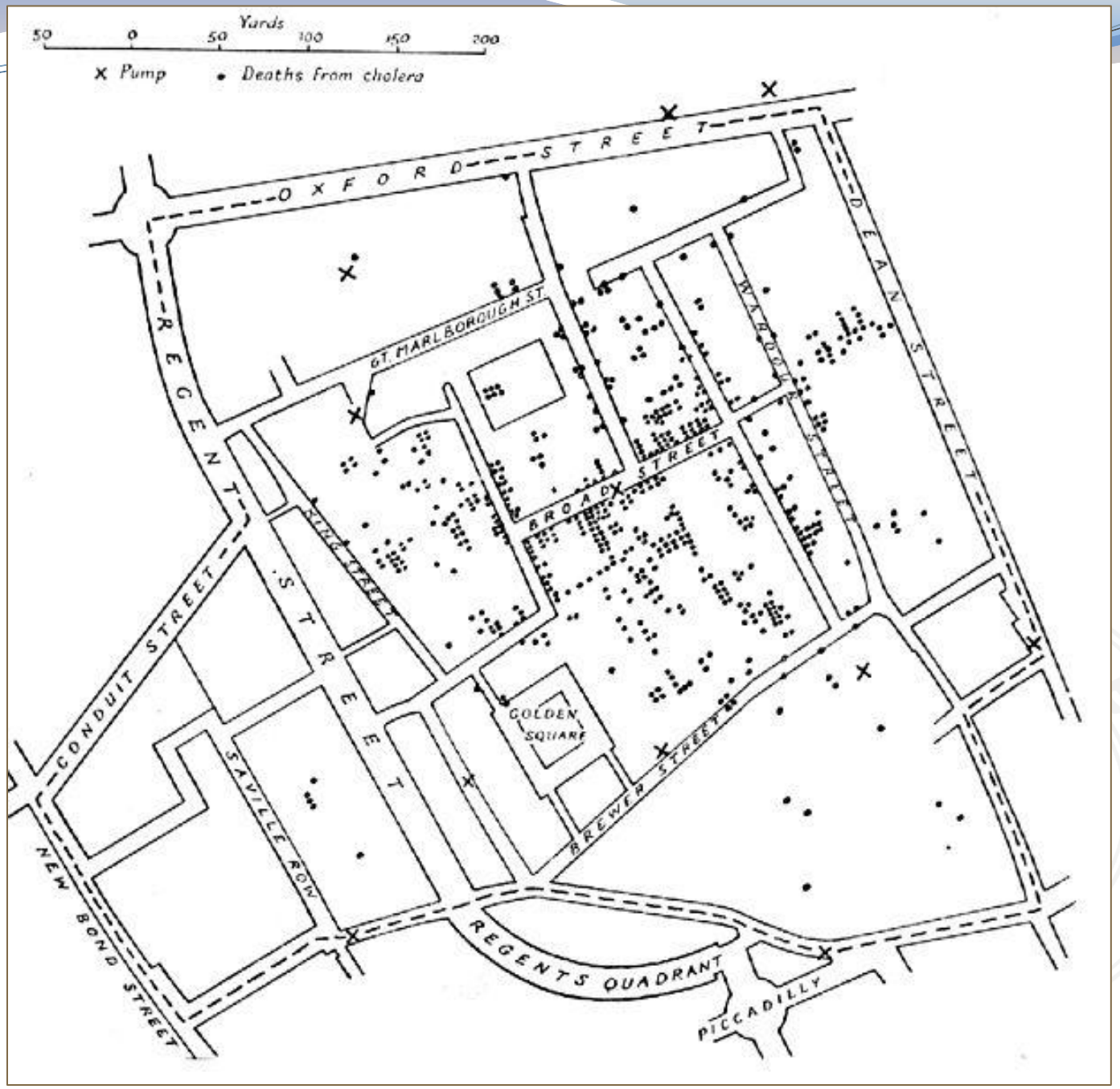
Activities

- We'll take about 15 minutes
- Discuss the two scenarios among your tables

Activities Cont.

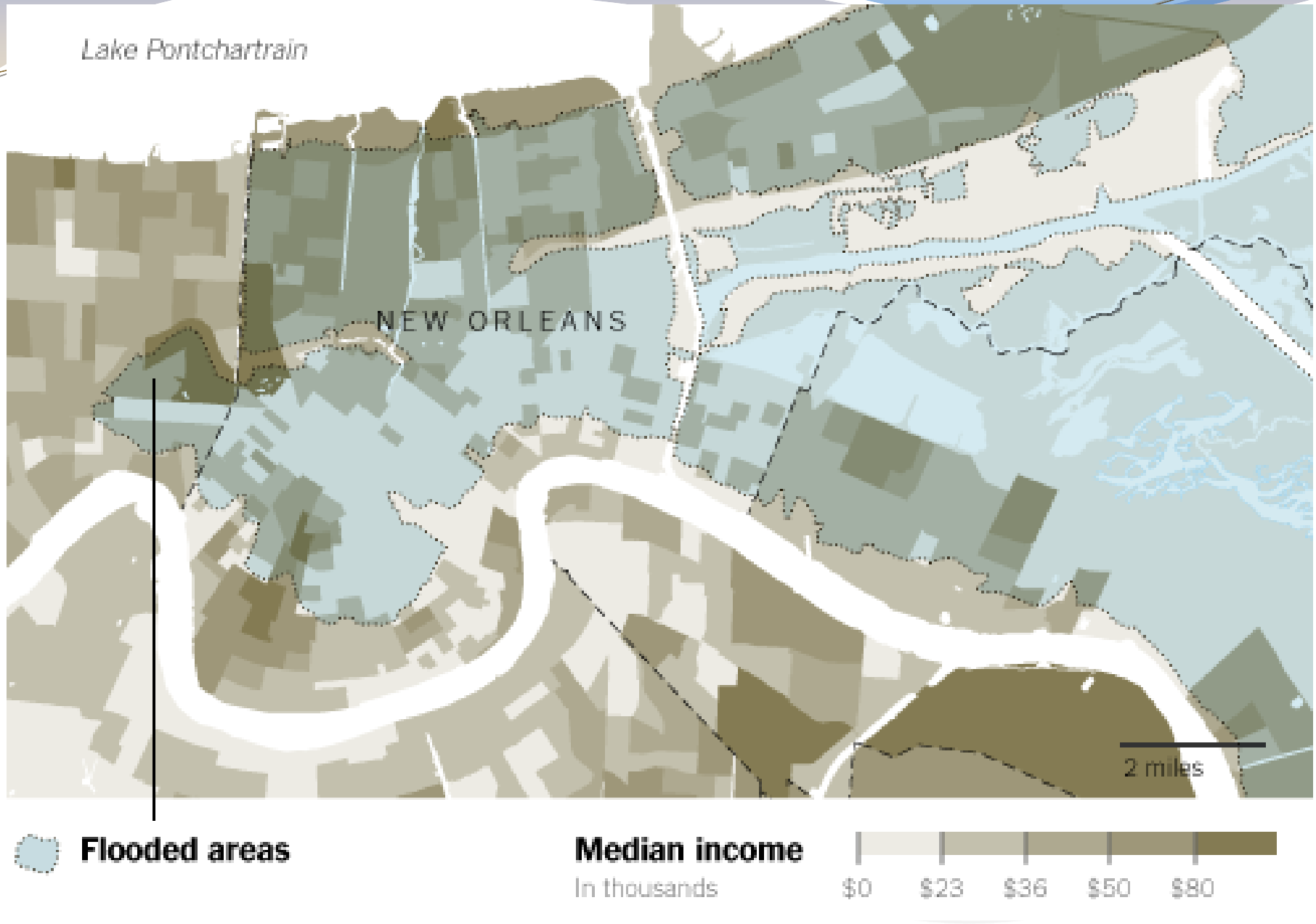
- It's 1854 London, hundreds are dying in SOHO and you need to figure out why
  - Each black bar represents one death
  - What, if any, causal relationship can you identify?
  - What needs to be done to eliminate outbreak?
  - What is you explanation for blocks that have no deaths?

- Katrina has struck and you are analyzing the aftermath
  - What patterns do observe?
  - What story does the Map tell?


50 0 50 100 150 200 Yards
X Pump
• Deaths from cholera
OXFORD STREET
GT. MARLBOROUGH ST.
REGENT STREET
BROAD STREET
WARWICK STREET
DEAN STREET
CONDUIT STREET
KING STREET
S T R E E T
GOLDEN SQUARE
SAVILLE ROW
BREWER STREET
NEW BOND STREET
REGENTS QUADRANT
PICCADILLY

John Snow – Pioneering Researcher

MAP 1.
REGENT STREET
OXFORD STREET
PRINCES STREET
HANOVER STREET
GEORGE STREET
MADDOX STREET
CLIFFORD STREET
SAVILE ROW
NEW BURLINGTON STREET
OLD BURLINGTON STREET
CORK STREET
BURLINGTON STREET
GREAT MARLBOROUGH STREET
ARGYLL PLACE
ARGYLL STREET
POLAND STREET
BROAD STREET
GOLDEN SQUARE
WARWICK STREET
GREAT PULTENEY STREET
BRUTON ST
CRAFTON STREET
ALBEMARLE STREET
DOVER STREET
SACKVILLE STREET
ALBANY
REGENTS QUADRANT
REGENT CIRCUS
PICCADILLY
HAYMARKET
JERMYN STREET
PANTON STREET
PRINCES STREET
OLD COMPTON STREET
QUEEN STREET
RICHMOND ST
GERRARD ST
LISLE STREET
LEICESTER STREET
CHURCH ST
SOHO SQUARE
CARLISLE STREET
GREEK STREET
FRITH STREET
QUEEN STREET
WORK HOUSE
GOLDEN SQUARE
C. F. Cheffins, Lith. Southampton Bldgs. London
SCALE 30 INCHES TO A MILE.



Source: http://www.ericson.net/content/2011/10/when-maps-shouldnt-be-maps/

Sometimes Tables are Better

Areas with significant flooding		Areas with little or no flooding
Population		
346,000		138,000
Race and ethnicity		
76%	BLACK	43%
18	WHITE	49
3	HISPANIC	4
2	ASIAN	2
1	OTHER	2
Age		
PERCENTAGE OF RESIDENTS THAT WERE:		
28%	UNDER 18	22%
11%	OLDER THAN 65	12%
Single-parent families		
29%	PERCENTAGE OF FAMILIES WITH SINGLE PARENTS	21%
Education		
72%	HIGH SCHOOL GRADUATE	82%
21%	BACHELOR'S DEGREE OR HIGHER	38%

Areas with significant flooding		Areas with little or no flooding
Income		
$25,759	MEDIAN HOUSEHOLD INCOME (1999)	$31,455
$4.9 BILLION	TOTAL AMOUNT EARNED BY ALL RESIDENTS	$3.2 BILLION
29%	POVERTY RATE	25%
PERCENTAGE OF HOUSEHOLDS WITH INCOMES OF:		
56%	LESS THAN $30,000	48%
6%	MORE THAN $100,000	13%
Houses		
145,000	NUMBER OF HOUSING UNITS	70,000
23%	HOUSES BUILT BEFORE 1940	44%
52%	OCCUPIED BY RENTERS	56%
Transportation		
29%	HOUSEHOLDS WITH NO VEHICLE	24%
21%	BACHELOR'S DEGREE OR HIGHER	38%

Recap of Key Points

Questions

Contact Information

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(503) 986-2255

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