

# Spatial Data Resources for Baltimore City

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# Objectives

1. To provide a brief introduction to spatial data
2. To identify open access Baltimore data resources available online
3. To demonstrate data acquisition of various subject matters and data types from multiple platforms
4. To provide examples of real world applications

# What is Spatial Data?

Any data that includes geographic locations or addresses

## ○ Point Pattern

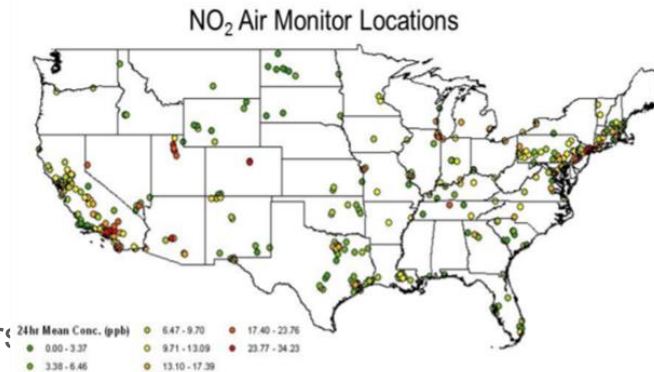
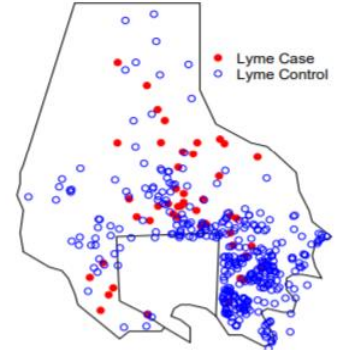
- Location of the event is the data
- (e.g.) location of a crime, sick person

## ○ Geostatistical

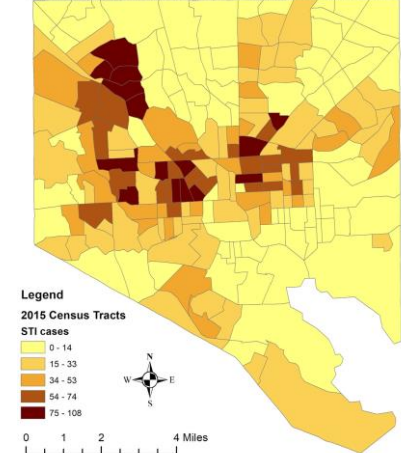
- Measurements are taken at points
- (e.g.) AQ concentrations at air monitors

## ○ Area Level

- Data that is attributed to an area, rather than a point
- (e.g.) median income per county



Number of STI cases per Tract, Baltimore City



# Why do we care about Spatial Data?

- Presentation: data visualization and translation
- Analysis: Spatial Science Paradigm

## **Spatial data**

Data with  
location  
information

## **GIS**

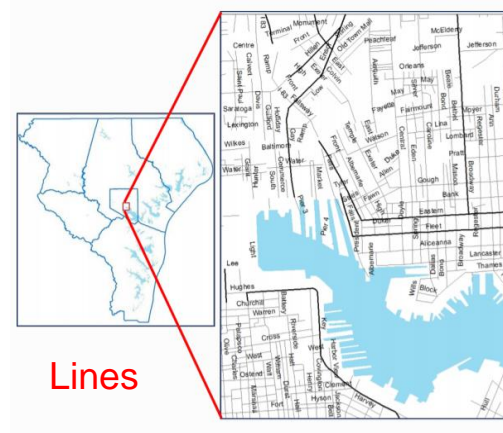
Software for  
mapping

## **Spatial statistics**

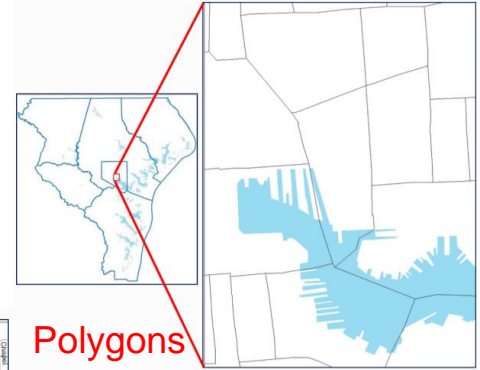
Statistics for  
analyzing spatial  
data

# File Formats of Spatial Data

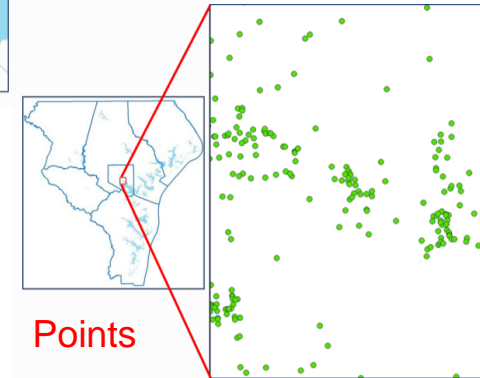
- Spatial data can come in many formats
  - Tabular Data (Excel, .csv, or other)
    - Can be attached to spatial data
    - Data can be geocoded
  - Vector data
    - Polygon
    - Line
    - Point
  - Raster
    - Imagery
    - Processed
- We will provide examples of each in our presentation



Lines



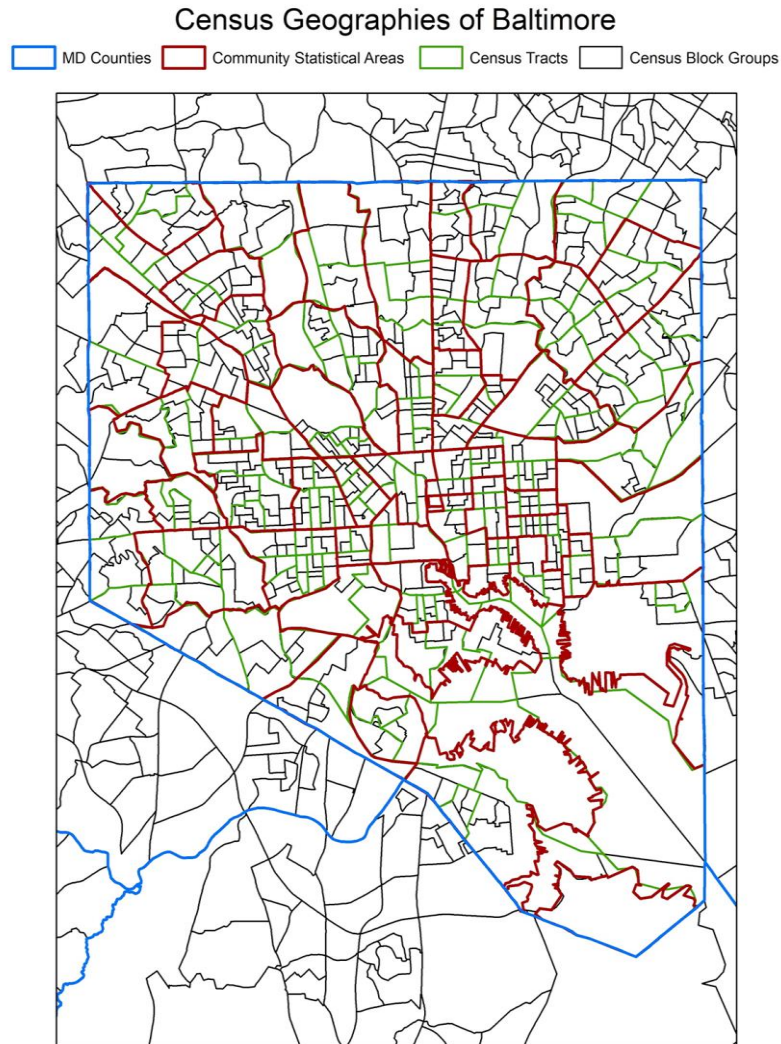
Polygons



Points

# Spatial Divisions of Baltimore City

- County
  - Community Statistical Areas (55)
    - Census Tracts (200)
      - Block Groups (650)
        - Blocks
- Neighborhoods
- Zip Codes



# Sources of Baltimore Data

## 1. Open Baltimore

- An open data program managed by the Baltimore City Office of the Chief Data Officer to aggregate data relevant to Baltimore City

## 2. Baltimore Neighborhood Indicators Alliance (BNIA)

- An organization at the University of Baltimore aiming to provide accurate data and objective research to describe the social, economic, and quality of life issues impacting the City

## 3. Baltimore CityView

- A web based GIS application designed to provide selected spatial information about City of Baltimore overarching businesses, managed by CDO

# Sources of Maryland Data

## 4. Maryland iMAP

- A mapping and GIS data portal by Maryland state government including access to spatial and non-spatial data and imagery

## 5. Maryland Food System Map

- An interactive mapping platform displaying data on the food system, environment, and public health, created by Johns Hopkins Center for a Livable Future

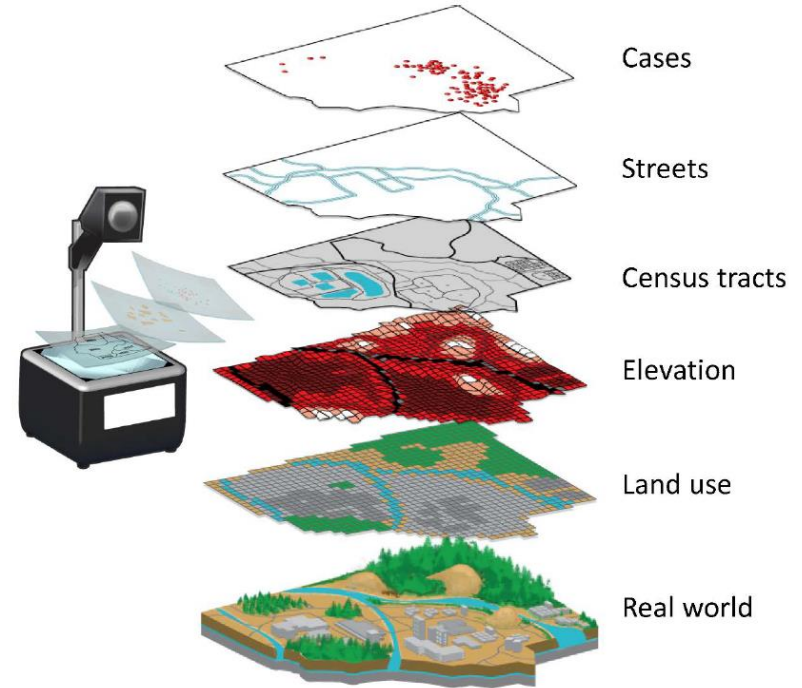
## 6. Other Local and National Sources



# Hands-on Demonstration

- We will identify various open data platforms, practice navigating each interface, and download some example files
- We will compile these files together into a single map using ArcGIS software

ArcGIS, a Geographic Information System developed by ESRI, is great for management and analysis of spatial data and for making presentation-level maps



# Summary of Sources

	<b>Open Baltimore</b>	<b>BNIA</b>	<b>Baltimore CityView</b>	<b>MD iMAP</b>	<b>Maryland Food System Map</b>
<b>Pros</b>	Broad range of data  Community can create unique datasets	Well organized CSA indicators  Tools for comparing within and between communities	Quick and easy visualization and map creation	Broad range of data across Maryland	Many unique datasets focusing on food systems and agriculture
<b>Cons</b>	Potential quality control issues	Data only available at CSA-level	Data only available as tables	Some data isn't available in Baltimore  May require manually subsetting to Baltimore City data	Many datasets are focused on more rural areas, excluding Baltimore City  Limited to food system- related variables

# Other Local Data Sources

- Department of Health: <https://health.baltimorecity.gov/stats-and-data>  
Provides links to Baltimore and Maryland data sources focusing on health, as well as links to various health department reports in PDF format.
- Department of Planning: <https://planning.baltimorecity.gov/planning-data>  
Provides links to raw data sources as well as data products with attention to people and demographics; education, children & economic well-being; transportation & housing; environment & health; and inequality in Baltimore
- GIS and Maps at Johns Hopkins: <http://guides.library.jhu.edu/gis/popular-sources>  
Provides a list of, and links to, popular data sources that focus on Baltimore and Maryland.
- Urban Health Institute: <http://urbanhealth.jhu.edu/resourcenet/>  
JHSPH affiliated institute focusing on East Baltimore. Provides a list of links to various Baltimore statistics data sources.
- Maryland Department of Housing and Community Development: <https://dhcd.maryland.gov/Maps/Pages/default.aspx>  
Provides a variety of interactive maps with information (mostly by county) on neighborhood characteristics and measures of economic development and well-being

# National Data Sources

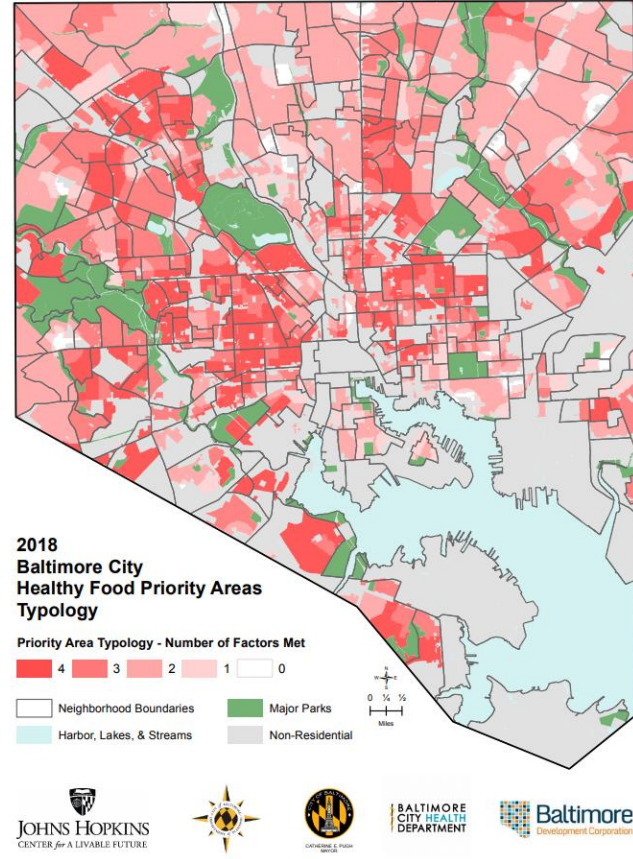
- The Census (American FactFinder): <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>  
Very broad range of data, does not include shapefiles
- The Census (TIGER/Line): <https://www.census.gov/geo/maps-data/data/tiger-line.html>  
Various shapefiles
- National Centers for Environmental Information: <https://www.ncdc.noaa.gov/data-access>  
Climate and environmental data, affiliated with National Oceanic and Atmospheric Administration
- Environmental Protection Agency: <https://edg.epa.gov/metadata/catalog/main/home.page>  
Broad range of environmental data
- Centers for Disease Control and Prevention: <https://www.cdc.gov/datastatistics/index.html>  
Broad range of health data
- United States Geological Survey: <https://www.usgs.gov/products/data-and-tools/gis-data>  
Environmental and satellite-derived imagery
- National Aeronautics and Space Administration: <https://earthdata.nasa.gov/>  
Satellite-derived imagery

# Considerations

- Beware redundancy of data between sources
  - Pick which platform works best for you and your objectives
- Interactive tools are helpful for exploration online but it's necessary to download the data for your own analyses
- Manually download individual datasets or batch download bulk data
  - Consider using (Application Programming Interface) API approaches
  - Consider using R, an open source statistical computing language

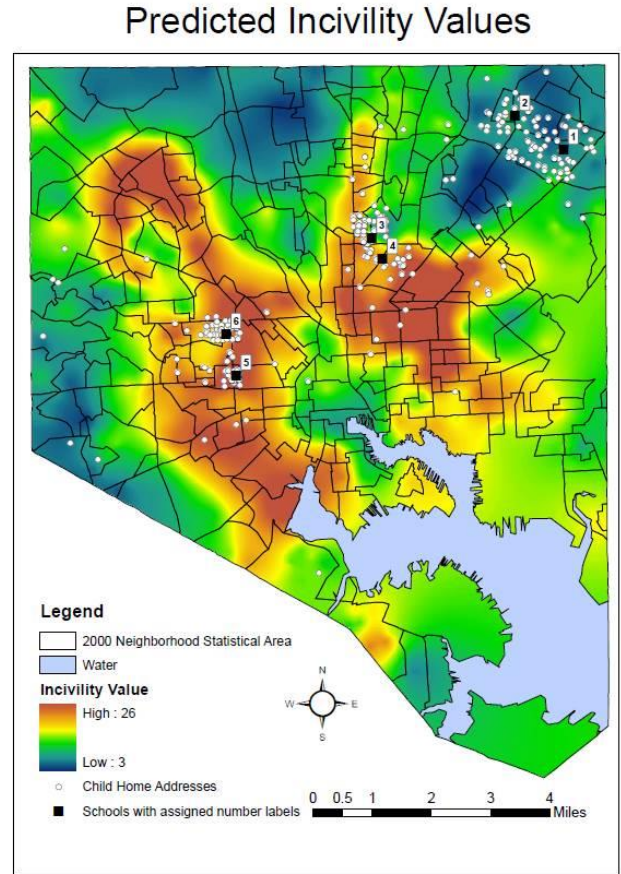
# Spatial Data Applications

- Baltimore City Food Environment
- Developed by CLF
- A food desert is defined as an area which meets four criteria:
  - Median Income under 185% of Federal Poverty Level
  - Household Vehicle Availability is under 30%
  - Distance to Supermarkets is more than 0.25 miles
  - Healthy Food Availability Index (HFAI) is under 9.5



# Spatial Data Applications

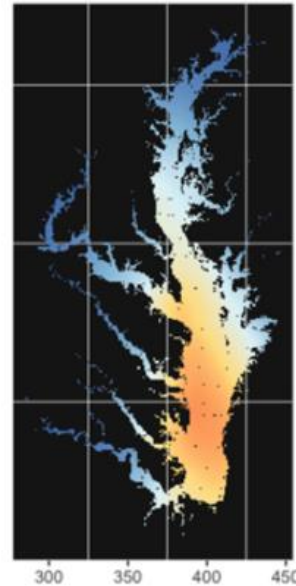
- Incivility information collected using Neighborhood Inventory of Environmental Typology (NIETy) method (98 factors summed to 1 total score)
- Incivility scores were assigned to centroids of a sample of city blocks
- Spatial statistics used to predict incivility at all locations in the city
- Higher levels of incivility have been associated with lower levels of perceived safety, potentially impacting whether children walk to school



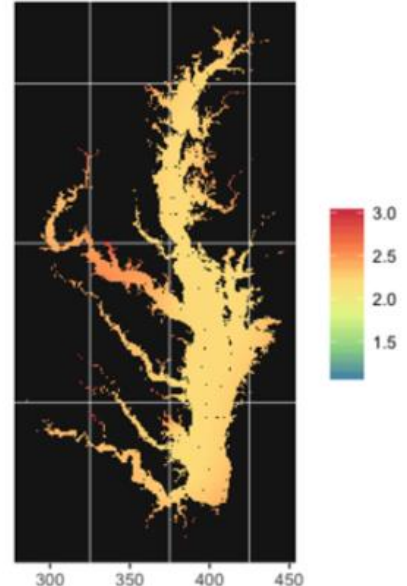
# Spatial Data Applications

- *Vibrio parahaemolyticus* (*Vp*) bacteria is one of the leading causes of foodborne illness
- Found in the waters of the Chesapeake Bay, and accumulates in oysters
- Associated with water temperature, turbidity, and other variables
- Spatial statistics used to predict *Vp* concentrations throughout the Bay

Salinity Predictions



Salinity Standard Error



Davis et al., 2017



# Give GIS a Go!

Spatial Science for Public Health Center website provides additional information and resources available:

<https://www.jhsph.edu/research/centers-and-institutes/spatial-science-center-for-public-health/index.html>

JOHNS HOPKINS CENTER FOR A LIVABLE FUTURE  
SPATIAL SCIENCE FOR PUBLIC HEALTH CENTER

## Discovering the World Through GIS

A Showcase of Work in GIS and Spatial Analysis

### Introductions

#### **Frank C. Curriero, PhD**

Director  
Spatial Science for Public Health Center  
Associate Professor  
Department of Epidemiology and Biostatistics

#### **Jamie Harding, MS**

GIS Specialist  
Center for a Livable Future  
Johns Hopkins Bloomberg School of Public Health

Wednesday, November 15, 2017  
Noon – 1:30 p.m.  
Feinstone Hall  
Wolfe Street Building

*Work by students, staff and faculty will also be presented in the form of a poster session. All are welcome!*

*For more information, please contact the Spatial Science for Public Health Center at SSPHC@jhu.edu.*

For disability access information or listening devices, please contact Scott Klein at sklein1@jhu.edu or 410-614-1550.