

PBL and GIS: John Snow and London's 1854 Cholera Epidemic

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Session Vocabulary

- **Spatial data**
- **Attribute**
- **Symbolize**
- **Filter**
- **Heat map**
- **Buffer**
- **Share**
- **Metadata**

Session Outcomes

Participants will know

- The meaning of spatial data
- How GIS can be used to analyze spatial data
- How GIS can be used to analyze disease data
- The importance of John Snow in the history of epidemiology
- That GIS is a tool for data analysis, problem-solving, and decision-making – not “just” a tool for making maps

Session Outcomes II

Participants will be able to:

- Work with spatial attributes, including symbolizing, classifying, filtering, and buffering.
- Work with data tables including sorting, calculating, and identifying data characteristics
- Perform simple analysis tasks and map the results of analysis

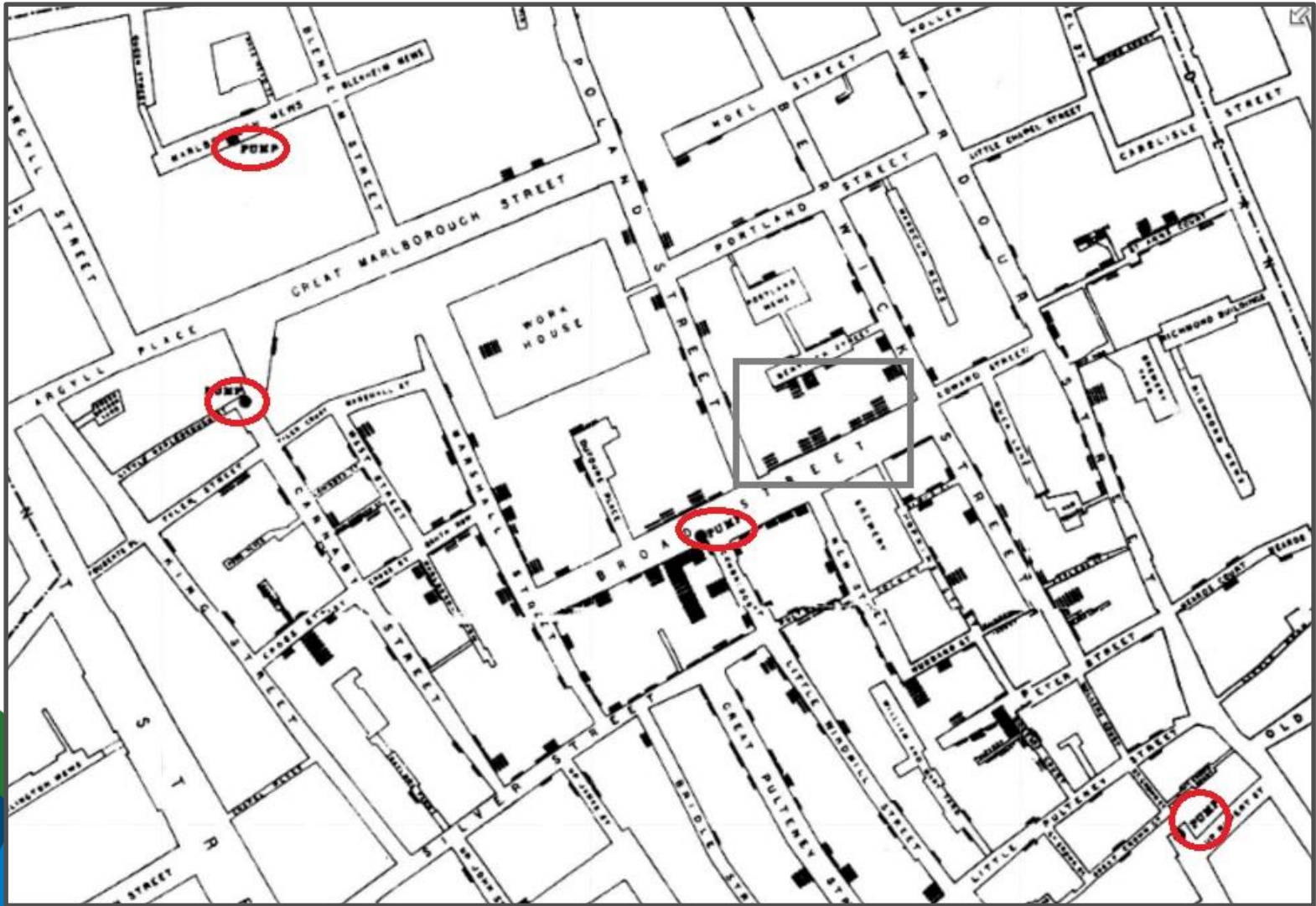
Medical Mystery: What caused the 1854 cholera epidemic in London?



Dr. John Snow thought he knew...







Open a GIS map of Snow's data

- Sign in to your ArcGIS Online account
- Create a Cholera folder in My Content
- Select and open learnarcgis cholera by Lyn_Malone_LearnArcGIS
- **Save** map to your own Cholera folder and **share** with my organization

You're the detective...the data provides the clues...analyze them with GIS

- Explore map layers, attributes, and data tables
- **Analysis 1**
 - Examine patterns; note brewery
 - Change symbol style on num_cases
 - Filter data for num_cases > 1
 - Clear filter; create heat map
- **Analysis 2**
 - Buffer pumps by 500 feet
 - Summarize number of deaths **within** each buffer. Choose num_cases with Sum option.

Analysis, continued...

- **Analysis 3**

- Calculate % of total deaths in each buffer to id the pump most likely to be the source of cholera bacteria:
- (1) Sum Number of Cases > Statistics. Note the #.
- (2) Table Options > Add Field > per_of_total_cases > type: Double > Calculate field > $(\text{SUM_Num_Cases} / 745) * 100$ > Sort new field in Descending order

Analysis, continued...

- **Analysis 4**

- Calculate a route from John Snow's office to each of the water pumps.
- Analysis > Use Proximity > Plan Routes
- Input point layer: Public Water Pumps, Travel mode: Walking; Routes begin at: Oxford & Charing Cross Rd (located northeast of cases). Routes end at: Return to Start. Max number of vehicles: 1. Max stops: 15. Time spent at each: 30 minutes. Limit total route time to 24 hours. Name result and save it in your working folder. Analyze results.

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