GEOG 204

LECTURE 8

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Lit. Review – Nov 8

Final Exam – Nov 29
(Cumulative, 45 Mins, Tutorial Session)

Projects – Dec 6
(Presentations and Submissions)

Dates to Remember

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GIS History

- Man's desire to know his surroundings
- Cartography is an old occupation
- Early comparison to moderns to modern GIS functions can be traced to in the early 1800s

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Von Thunen Model for Land Use Change, 1826

- Von Thunen hypothesized that a pattern of rings around a city state would develop if the city was in an isolated state
  - The land is completely flat and has no rivers or mountains to interrupt the terrain.
  - The soil quality and climate are consistent throughout the State.
  - Farmers in the Isolated State transport their own goods to market via oxcart, across land, directly to the central city in straight line.
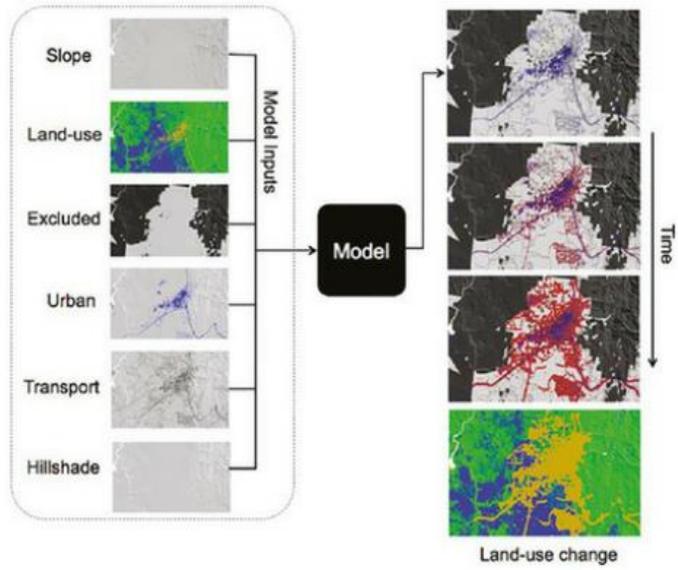 - Farmers act to maximize profits.
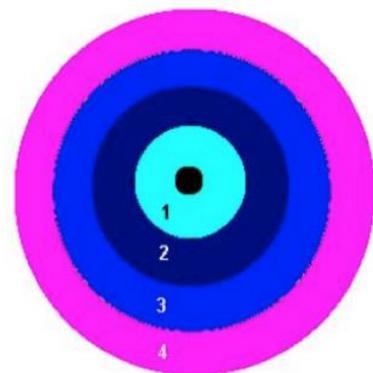
- Central City
1 Intensive farming and dairying
2 Forest
3 Increasing extensive field crops
4 Ranching, animal products

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Sleuth Model (Clarke et al, 1997)
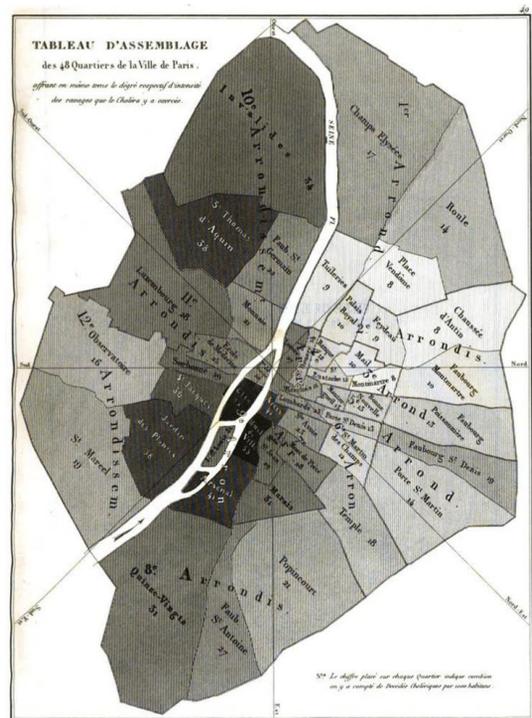

Land-use change

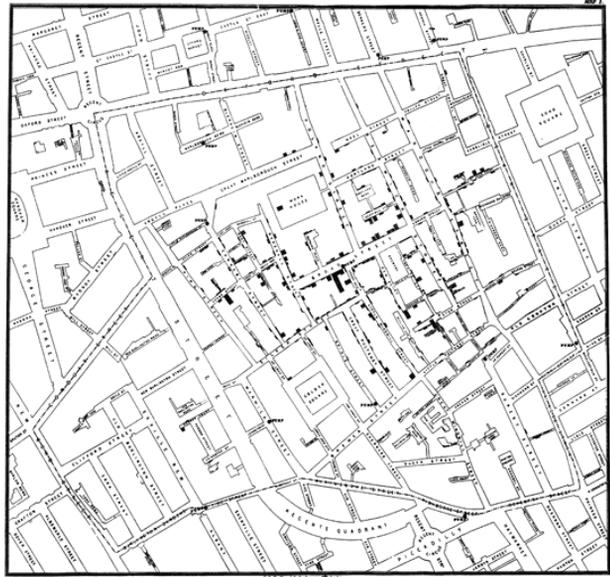Charles Picquet, 1832
A map showing Cholera deaths in Paris

- https://gallica.bnf.fr/ark:/12148/bpt6k84
2918#

- https://www.gislounge.com/history-of-
gis/

John Snow, 1854
Cholera death's in London

- https://www.ph.ucla.edu/epi/snow/snow book.html
- http://blog.rtwilson.com/john-snows-famous-cholera-analysis-data-in-modern-gis-formats/

Presentation Title

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GIS: A Brief History

- Early Motivations
    - Difficulty of obtaining accurate measurements from maps
    - Integration of data about multiple types of features/phenomena (census tracts, traffic analysis zones, places of work)
    - Working with increasingly large datasets
    - Editing maps during the cartographic production process
    - The need to integrate multiple layers of information in assessing the ecological studies
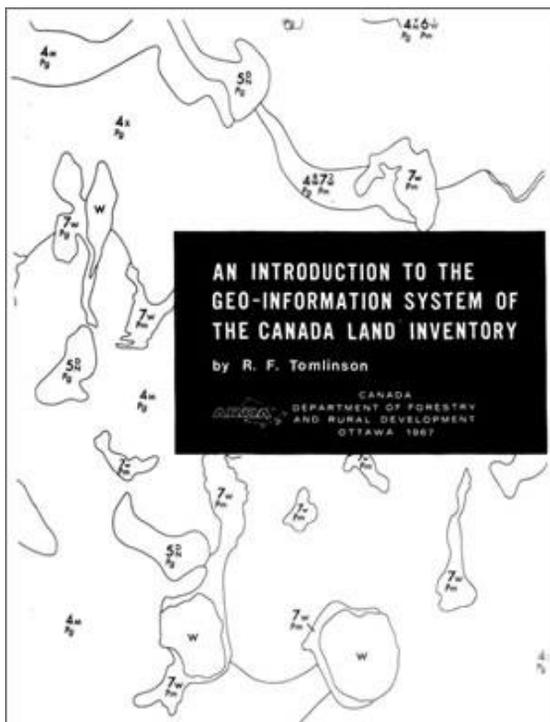
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Goodchild 2004

The Early years

- The 1960s were a period significant development in the area geographic information
  - Post war period, rapid developments in the area of remote sensing
  - The emergency of the computer
- Early concepts of quantitative and computational geography emerged.
- A confluence of forces that led to the emergence of GIS, albeit limited to the academic community.

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AN INTRODUCTION TO THE GEO-INFORMATION SYSTEM OF THE CANADA LAND INVENTORY
by R. F. Tomlinson

CANADA
DEPARTMENT OF FORESTRY AND RURAL DEVELOPMENT
OTTAWA 1967

- Roger Tomlinson's development of the the Canada Geographic Information System in 1963.
- A government commission to create a manageable inventory of its natural resources.
  - He envisioned using computers to merge natural resource data from all provinces.
  - He gave GIS its name.

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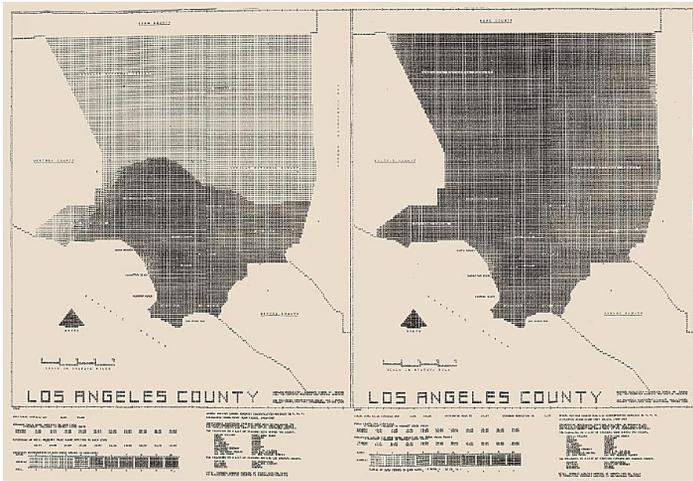
ESRI

- The Harvard Laboratory for Computer Graphics and Spatial Analysis
    - Some of the first computer map-making software was created and refined at the Lab
    - A research center for spatial analysis and visualization.
    - Many of the early concepts for GIS and its applications were conceived at the Lab by a collection of geographers, planners, computer scientists, mathematicians
        - Including Jack Dangermond the ESRI Founder

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GIS History

- Early GIS
    - The early GIS occurred in several disparate areas.
        - Each unit developed its own GIS

    - 1980s low cost computers
        - The emergency of commercial GIS
            - Enterprise GIS (aimed at enterprises/commercial entities)
                - MapInfo
                - Smallworld
                - ESRI

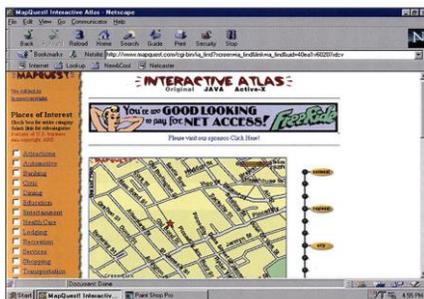12

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GIS History

- Mid 1990s GIS
  - Moore's law:
    - the number of transistors in a dense integrated circuit doubles approximately every two years.
      - Cheaper and more powerful computers
      - Graphical user interfaces
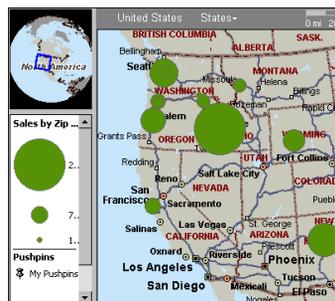 - Internet accessibility

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GIS Trends

- Mid 1990s GIS
  - Increased adoption of GIS (Enterprise)
  - The start of consumer GIS

On the web
MapQuest 1996

Desktop
Microsoft Encarta 1996
Microsoft MapPoint 2000

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GIS Trends

- Smallworld Innovations
  - Raster-Vector integration
    - Before this, systems were either raster or vector
  - Versioning
    - E.g. to link current and future
      - For example proposed infrastructure to current state
  - Linking to large databases

  - Object Oriented Programming (as opposed to procedural programing)
    - Fast development cycle

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GIS Trends

- Adoption of Open Source Geo

Peter Batty, 2017. GIS in Rockies

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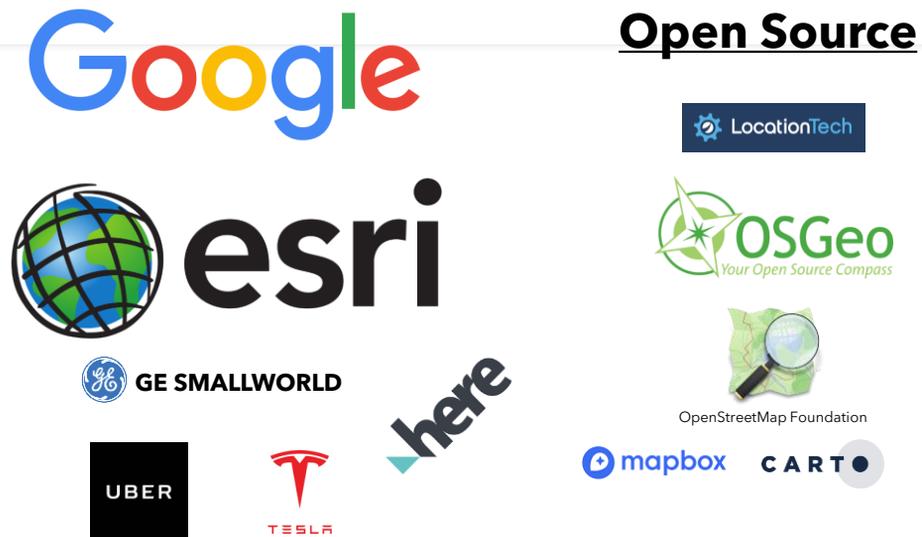
GIS Trends

- Missing pieces
  - Being explored in academia
    - Uncertainty in GIS
    - Time in GIS
    - 3D GIS
    - ...

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GIS: Current Players

Open Source

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GIS: Current Trends

- Mobile GIS
  - Hybrid online/offline access
- Cloud
- Data access and availability
- Augmented Reality & Mixed Reality
- Data capture
  - 3D scanning
  - Photo to point cloud
  - 360 capture

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Augmented Reality

- https://www.vgis.io/esri-augmented-reality-gis-ar-for-utilities-municipalities-locate-and-municipal-service-companies/#:~:targetText=GIS%20data%20in%20Augmented%20Reality,of%20a%20physical%20job%20site.

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Talking about data capture…

- https://twitter.com/Brett_A_Taylor/status/93270134408292 3520

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GIS Trends

- Location is now pervasive in consumer applications

  - Has GIS left then?
    - Geo-technology
    - GIScience
    - Metaverse

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References

- Goodchild, M. F. and Haining, R. P. (2004), GIS and spatial data analysis: Converging perspectives. Papers in Regional Science, 83: 363–385. doi:10.1007/s10110-003-0190-y
    - http://www.geog.ucsb.edu/~good/papers/387.pdf

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