

GEOG 204

LECTURE 15

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Final Exam - Nov 30
(Cumulative, 45 Mins, Room 7-238)

Projects - Dec 7
(Submissions Due)

Dates to Remember

2

Next Week (Nov 21, 23) Lectures Canceled

I will be available in the lecture room for any question/support regarding course material and projects

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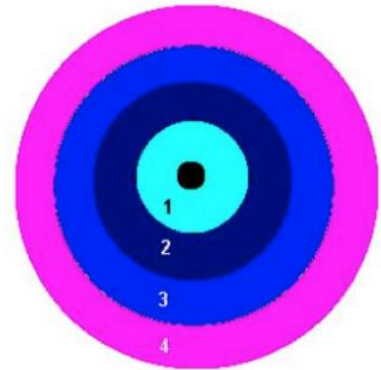
GIS History

- 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.



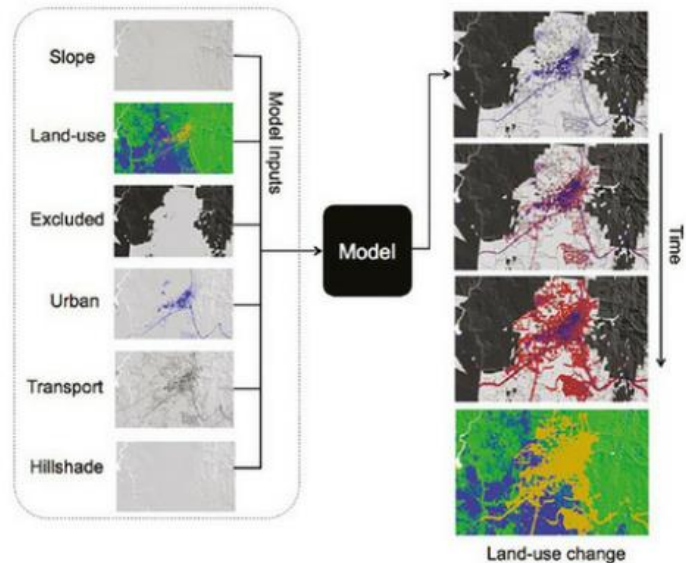
- Central City
- 1 Intensive farming and dairying
- 2 Forest
- 3 Increasing extensive field crops
- 4 Ranching, animal products

Presentation Title

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Sleuth Model (Clarke et al, 1997)



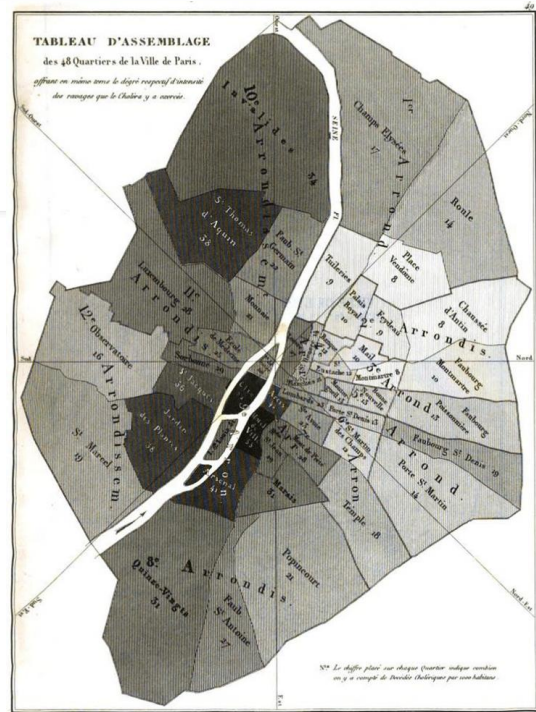
Presentation Title

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Charles Picquet, 1832
A map showing Cholera deaths in Paris

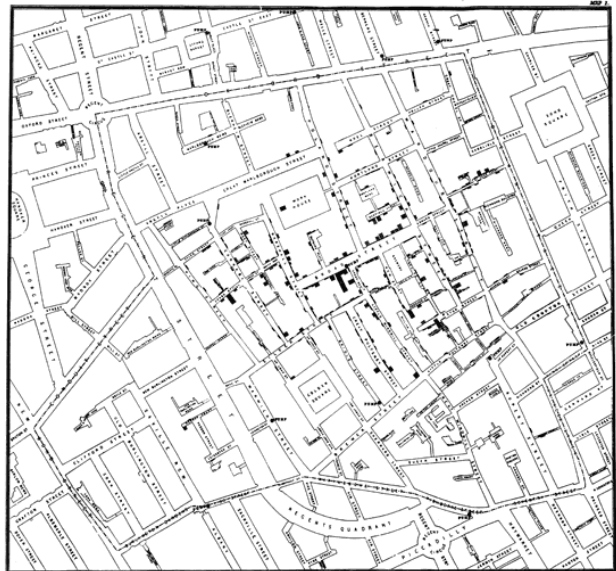
- <https://gallica.bnf.fr/ark:/12148/bpt6k842918#>
- <https://www.gislounge.com/history-of-gis/>



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John Snow, 1854
Cholera death's in London

- <https://www.ph.ucla.edu/epi/snow/snowbook.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

Goodchild 2004

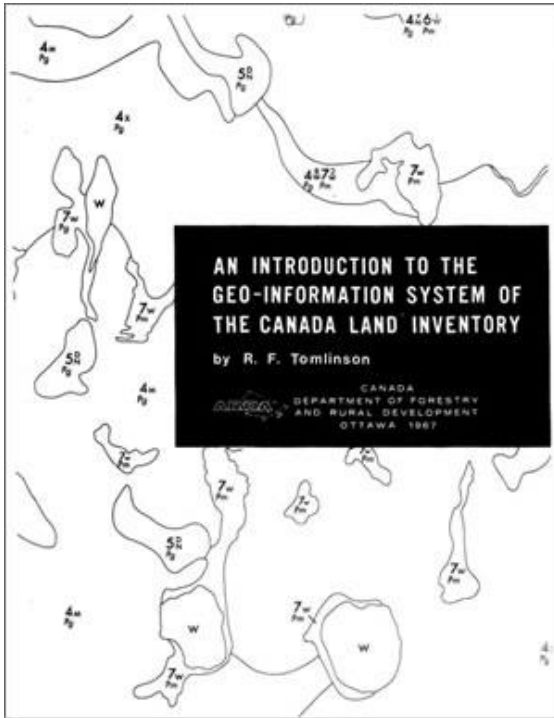
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The Early years

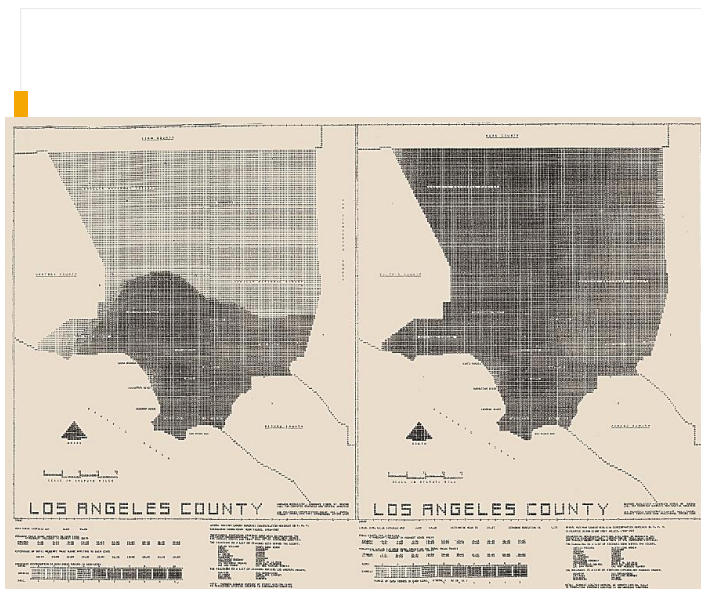
- The 1960s were a period significant development in the area geographic information
 - Post war period, rapid developments in the area of remote sensing
 - The emergency of the computer
- Early concepts of quantitative and computational geography emerged.
- A confluence of forces that led to the emergence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

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- 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

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GIS History

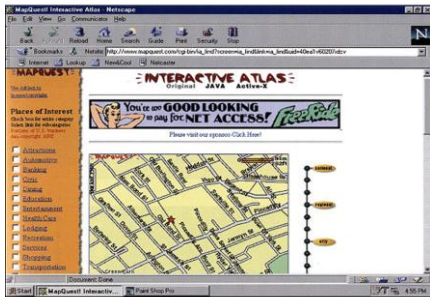
- Mid 1990s GIS
 - Moore's law:
 - the number of transistors in a dense integrated circuit doubles approximately every two years.
 - Cheaper and more powerful computers
 - Graphical user interfaces
 - Internet accessibility

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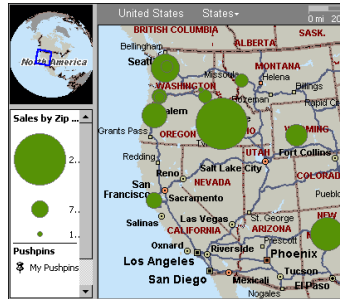
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GIS Trends

- 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 programming)
 - 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



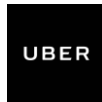
Open Source








OpenStreetMap Foundation





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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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GIS: Current Trends

- From the earliest days GIS have been used to support decision-making
 - resource allocation based on census data
 - finding the most optimal routes for transportation
 - customer segmentation and profiling
 - spatial planning support tool
 - facility service area allocation
- GIS continues to be at the center of geographical modelling and decision support
 - to explore relationships and process of the natural world

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Augmented Reality

- <https://www.vgis.io/>
- <https://www.youtube.com/watch?v=Wg6jN-audEM>

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Talking about data capture...

- https://twitter.com/Brett_A_Taylor/status/932701344082923520

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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>