Geospatial Concepts & Mapping Workshop

ARL Digital Scholarship Institute 2019

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Welcome & Agenda

- Introduction to spatial thinking and geospatial data (20 min.)
- Digging into digital scholarship projects (40 min.)
- Georeferencing historical maps (25 min.)
- *BREAK (30 min., 10:30 | 3:00)*
- Building a web map with ArcGIS Online (75 min.)
- Closing discussion (15 min.)

Spatial Thinking

Thinking spatially integrates spatial concepts with processes of reasoning, often relying on internal or external representations to enable or facilitate and support the experience.
(National Research Council, 2006)

A single act of spatial thinking also involves visualizing and interpreting location, position, distance, direction, patterns, relationships, movement, and change through space and time.
(Sinton, 2014; Sinton et al., 2013)

Spatial Thinking IRL

- Packing the trunk of a car to go on vacation
- A written grocery list used to efficiently navigate the floorplan of a supermarket
- Awareness of construction and detours to determine the fastest route to your destination
- Mowing the lawn while avoiding flower beds and trees (and little helpers)

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"Miles of Aisles" by sea turtle is licensed under CC BY-NC-ND 2.0

"Road Closed" by jo.schz is licensed under CC BY-NC-SA 2.0

"Three men mowing the lawn" by jaywood_uk is licensed under CC BY-NC-SA 2.0

Activity #1

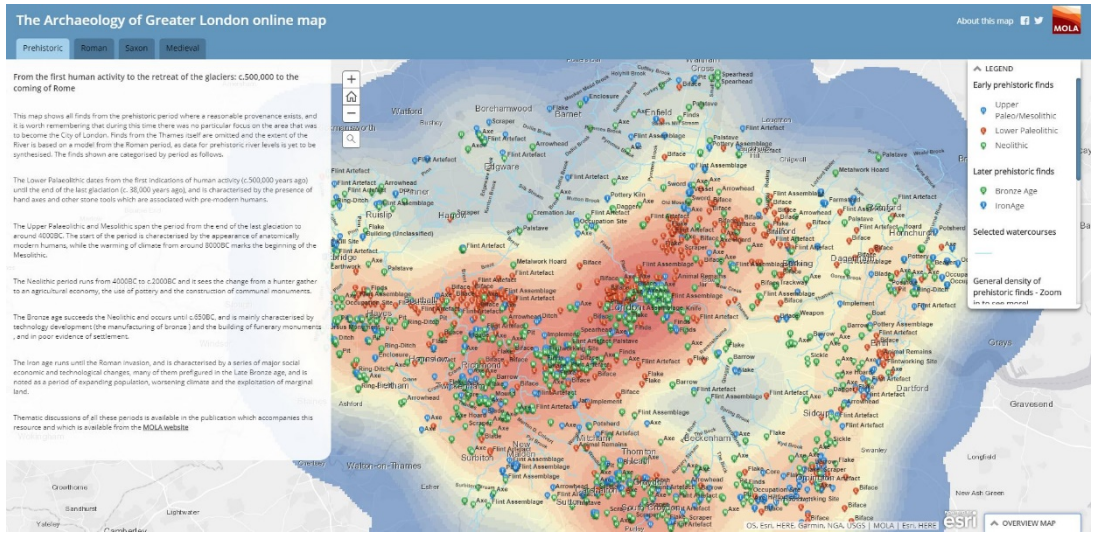
Put on your spatial thinking cap!

Task 1: Draw the route you took this morning to arrive at the library. Take 3 minutes and draw your path.

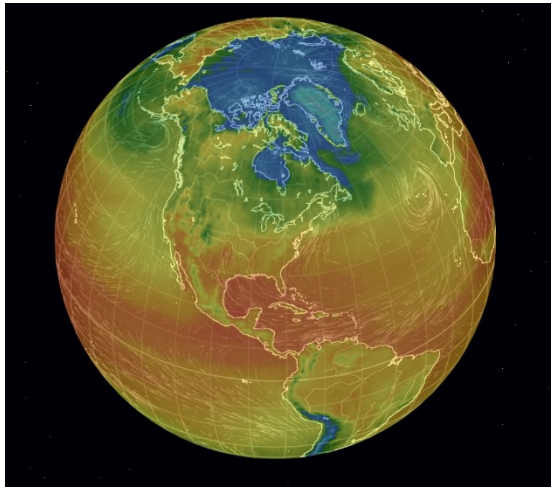
Task 2: Share with your neighbor. Take 2 minutes to discuss the similarities? Differences?

Geospatial Data

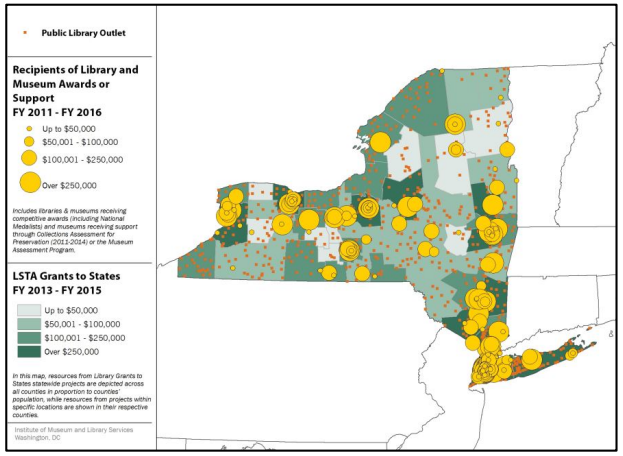
- Any data that has geographic location as one of its attributes
- Anything! (as long as we can tie it to a physical location on the Earth)
- All **geographic features** (*"where something is"*) are connected to other **attributes** (*"what/when something is"*)
- Sometimes data need to be reformatted or "spatialized" to be used for making maps or performing analyses



Museum of London Archaeology. The Archaeology of Greater London.



Byrd Polar and Climate Research Center. Fluid Earth Viewer (FEVer).



IMLS Funding Report. New York, FY2011-2016.

Geospatial Data

Attributes

Other attributes

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	LIBRARY NAME	LIBRARY SYSTEM	ADDRESS	CITY	STATE	LATITUDE	LONGITUDE	PHONE	COUNTY	LOCALE	COUNTY POPULATI	OUTLET TYPE	SQ FEET
2	WASHINGTON CARI	WASHINGTON CARI	300 WEST MAIN ST	WASHINGTON	IN	38.656928	-87.179252	812-254-4586	DAVIESS	33	32,906	CE	14,000
3	ODON WINKELPLEC	ODON WINKELPLEC	202 WEST MAIN ST	ODON	IN	38.842678	-86.992441	812-636-4949	DAVIESS	43	32,906	CE	3,948
4	FERDINAND BRANC	JASPER-DUBOIS CC	112 EAST 16TH STI	FERDINAND	IN	38.229131	-86.861189	812-367-1671	DUBOIS	42	42,461	BR	17,000
5	JASPER-DUBOIS CC	JASPER-DUBOIS CC	1116 MAIN STREET	JASPER	IN	38.395141	-86.930796	812-482-2712	DUBOIS	32	42,461	CE	10,000
6	DUBOIS BRANCH	JASPER-DUBOIS CC	5506 MAIN STREET	DUBOIS	IN	38.445409	-86.802414	812-678-2548	DUBOIS	42	42,461	BR	5,600
7	BIRDSEYE BRANCH	JASPER-DUBOIS CC	100 SOUTH STATE	BIRDSEYE	IN	38.315648	-86.694697	812-389-1030	DUBOIS	43	42,461	BR	2,000
8	HUNTINGBURG PUE	HUNTINGBURG PUE	419 NORTH JACKSC	HUNTINGBURG	IN	38.2974	-86.953747	812-683-2052	DUBOIS	32	42,461	CE	5,734
9	OWENSVILLE CARN	OWENSVILLE CARN	110 SOUTH MAIN S	OWENSVILLE	IN	38.271931	-87.691436	812-724-3335	GIBSON	42	33,775	CE	2,052
10	PRINCETON PUBLIC	PRINCETON PUBLIC	124 SOUTH HART S	PRINCETON	IN	38.35458	-87.568757	812-385-4464	GIBSON	32	33,775	CE	12,200
11	FORT BRANCH-JOH	FORT BRANCH-JOH	107 EAST LOCUST	FORT BRANCH	IN	38.247363	-87.577572	812-753-4212	GIBSON	31	33,775	CE	5,067
12	HAUBSTADT BRANC	FORT BRANCH-JOH	101 WEST GIBSON	HAUBSTADT	IN	38.205138	-87.574802	812-768-6005	GIBSON	31	33,775	BR	2,500
13	OAKLAND CITY-COL	OAKLAND CITY-COL	210 SOUTH MAIN S	OAKLAND CITY	IN	38.337233	-87.346144	812-749-3559	GIBSON	32	33,775	CE	6,300
14	BICKNELL-VIGO TO	BICKNELL-VIGO TO	201 WEST 2ND STR	BICKNELL	IN	38.772816	-87.308268	812-735-2317	KNOX	33	37,927	CE	4,536
15	SANDBORN BRANCI	BICKNELL-VIGO TO	112 NORTH ANDERS	ANDBORN	IN	38.897385	-87.186826	812-694-8403	KNOX	42	37,927	BR	1,728
16	KNOX COUNTY PUE	KNOX COUNTY PUE	502 NORTH 7TH ST	VINCENNES	IN	38.678846	-87.524037	812-886-4380	KNOX	33	37,927	CE	17,496
17	LOOGOOTEE PUBL	LOOGOOTEE PUBL	106 NORTH LINE ST	LOOGOOTEE	IN	38.676943	-86.914028	812-295-3713	MARTIN	32	10,226	CE	3,000
18	SHOALS PUBLIC LIE	SHOALS PUBLIC LIE	404 HIGH STREET	SHOALS	IN	38.666068	-86.790302	812-247-3838	MARTIN	42	10,226	CE	3,600
19	PERRY COUNTY BC	PERRY COUNTY PU	2328 TELL STREET	TELL CITY	IN	37.955268	-86.749101	812-608-0444	PERRY	41	19,347	BS	-3
20	PERRY COUNTY PU	PERRY COUNTY PU	2328 TELL STREET	TELL CITY	IN	37.955268	-86.749101	812-547-2661	PERRY	41	19,347	CE	15,240
21	CANNELTON PUBLI	PERRY COUNTY PU	210 SOUTH 8TH ST	CANNELTON	IN	37.911957	-86.74026	812-547-6028	PERRY	32	19,347	BR	4,734
22	PIKE COUNTY PUBL	PIKE COUNTY PUBL	1008 EAST MAPLE	PETERSBURG	IN	38.490315	-87.274558	812-354-6257	PIKE	43	12,594	CE	4,000
23	WINSLOW LIBRARY	PIKE COUNTY PUBL	105 CENTER STREE	WINSLOW	IN	38.382939	-87.216177	812-789-5423	PIKE	42	12,594	BR	2,500

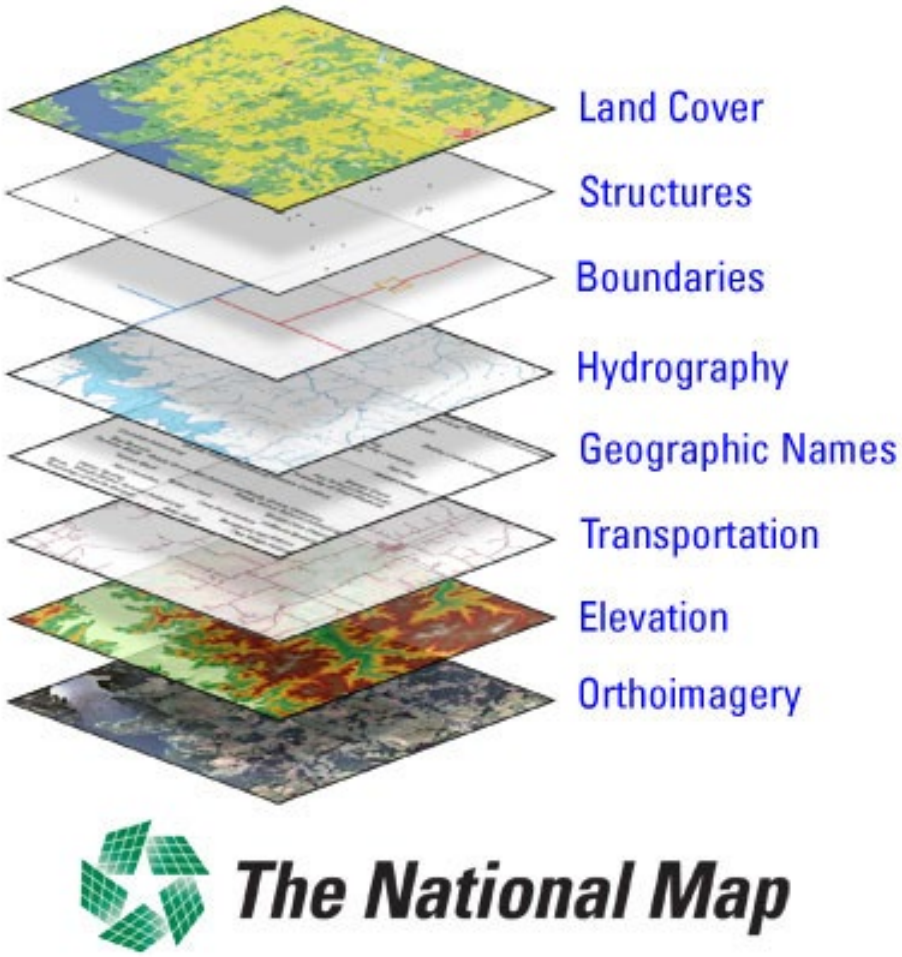
Image credit: Emily Sherwood, University of Rochester and Mireille Djenno, Indiana University

What is GIS?

Geographic **I**nformation **S**ystems

- An integrated system of hardware, software, data, and people designed to store, manipulate, query, analyze, and visualize geographically referenced information or geospatial data

- "Toolbox" for exploring relationships between the *what*, *when*, and *where* and answering questions in which location, space, or place may be key



United States Geological Survey [Public domain]

Why use GIS?

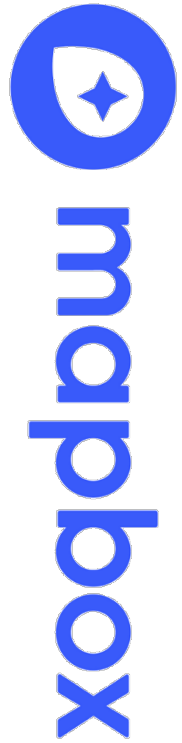
It all starts with your research question(s)

GIS can help you to:

- Visualize and contextualize relationships in terms of space and time
- Analyze patterns and conceptualize new research questions and methods
- Communicate research effectively with clear, relatable, and possibly interactive maps

GIS & Mapping Applications

- ArcGIS / QGIS
- ArcGIS Online / Carto / Tableau
- Google Maps / Google Earth
- StoryMaps / Neatline
- Mapbox / Leaflet
- Georeferencer / Map Warper
- OpenStreetMap
- Many others!!!



Project Showcase

American Religious Sounds Project

- https://religioussounds.osu.edu/
- Isaac Weiner (Ohio State) and Amy DeRogatis (Michigan State)

Mapping the “Land of Hiawatha”

- http://www.camdenburd.com/hiawatha/
- Camden Burd (Rochester)

How did they make that?

Use (some or all of) the following questions to think about and discuss your chosen project:

1) Is this a mapping or a GIS project?
2) Who created the project? What library expertise was needed?
3) Who is the audience for the project?
4) What is the underlying/implied research question?
5) How many people make up the project team?
6) What tools were used to create this project?
7) What are the data sources? Where did they come from?
8) What data might be missing?
9) Beyond the technology, what other skills, expertise and/or resources might be needed (e.g., data curation, metadata, storage, copyright) to create this project?
10) What might be added to or subtracted from any of these projects to make it appropriate for a different audience/objective? What other research questions could be generated from the data set?
11) Could this project be used in a classroom? If yes, how? If not, why not?

Activity #2

Georeferencing historical maps

1) Introduction & Demo

2) Exercise & Discussion

Activity #3

Special Thanks

Special thanks to the following individuals, upon whose work in previous institutes we have built:

Emily Sherwood (esherwood@library.rochester.edu)
Director, Digital Scholarship Lab
University of Rochester

Mireille Djenno (mdjenno@indiana.edu)
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Indiana University

Amy Work (awork@ucsd.edu)
GIS Librarian, Geisel Library
UC San Diego

References

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