

symbols

cartography + spatial data visualization

2026.09.10

what makes map symbols work?

1 phenomena

earthquake, travel
path, launch site,
population count,
elevation

2 data

encoding,
standardization,
spreadsheets,
shapefiles

3 graphic mark

point, line, polygon,
icon, shape, shading,
contour line,
hachure

**geographic phenomena have
three spatial attributes:**
form, continuity, location

form

what is it?

points, lines,
areas,
volumes?

continuit

y

where does it end?
discrete or not?

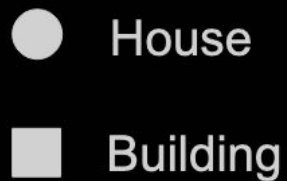
location

where is it??

lat/long?
position on earth?

form

point



line



area



volume



difference

resemblance

relation

convention

difference
resemblance
relation
convention



difference
resemblance
relation
convention

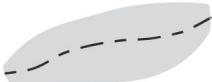
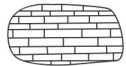
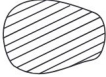
Some map symbols look like particular data or concepts. A map showing the location of airports uses an airplane symbol. Airplanes make us think of airports.



Maps in a war atlas use red explosion symbols to show the location of battles. The symbol looks like an explosion, and we think of danger or conflict.



difference
resemblance
 relation
 convention

	PICTORIAL	ASSOCIATIVE	ABSTRACT
POINT SYMBOLS	 School  Mine	 Mountain Peak  Building	 City  Airport
LINE SYMBOLS	 Highway  Railroad  River	 Disputed Boundary	 Railroad  Trail
AREA SYMBOLS	 Coniferous Forest  Grassland	 Woodland  Limestone	 Forest  Crops

difference
resemblance
relation
convention

Some map symbols intuitively suggest general kinds of data. A map showing the population of different cities uses circle sizes from small to large: sizes vary in amount, as do the data.

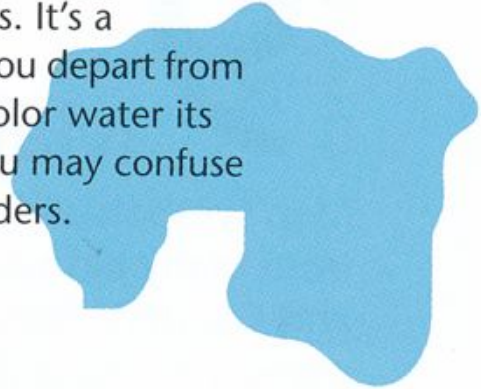


A map showing restaurants, antique stores, and museums in a town uses different shapes; shapes vary in kind, as do the data.

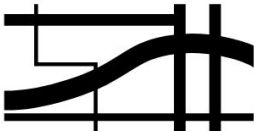
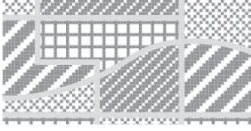


difference
resemblance
relation
convention

Most maps use blue for water.
But water is not usually blue.
Except on maps. It's a
convention. If you depart from
conventions (color water its
actual color) you may confuse
your map's readers.



visual variables

	Points	Lines	Areas	Best to Show
Shape		<i>Possible, but too Weird to Show</i>	<i>Cartogram</i>	<i>Qualitative Differences</i>
Size			<i>Cartogram</i>	<i>Quantitative Differences</i>
Color Hue				<i>Qualitative Differences</i>
Color Value				<i>Quantitative Differences</i>
Color Intensity				<i>Qualitative Differences</i>
Texture				<i>Qualitative & Quantitative Differences</i>

national park service
map symbols

Accessibility



Camping and Picnicking



Clean Environment



Communications and Technology



Health and Safety



Information and Interpretation



Nature and Wildlife



Park Buildings



Park Sites



 AIS – Aquatic Invasive Species



Recreation (Land)



Recreation (Water)



Recreation (Winter)



Services



Transportation



Miscellaneous



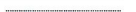
symbol libraries

united states
geological survey map
symbols

STRUCTURES	
Emergency Service Features	
Fire Station	
Hospital	
Police	
Public Service Features	
Cemetery	
City/Town Hall	
College/University	
Court House	
Post Office	
Prison	
School (K-12)	
State Capitol	
Trade/Technical School	
US Supreme Court	
The White House	
Recreational Features	
Cabin	
Campground	
Park Headquarters	
Picnic Area	
Ranger Station	
Shelter	
Trailhead	
Visitor Center	
Oil & Gas Pipeline Features	
Oil/Gas Pipeline*	
TRANSPORTATION	
Airport Features	
Airport Runway	
Heliport	
Seaplane	
Railroad Features	
Railroad	
Road Features	
Closed Road	
Expressway	

Ferry	
Four Wheel Drive	
Local Connector	
Local Road	
Ramp	
Secondary Highway	
Tunnel	
Road Shields	
Interstate Route	
State Route	
US Route	
Forest Service Primary Route	
Forest Service Secondary Route	
Forest Service High Clearance Route	
Trails	
Snow	
Terra	
Water	
HYDROGRAPHY	
Hydrographic Features	
Area of Complex Channels	
Canal/Ditch	
Coastline	
Underground Conduit	
Dam	
Earthen Dam	
Nonearthen Dam	
Estuary	
Flume	
Foreshore	
Gaging Station	
Gate	
Ice Mass	
Inundation Area	

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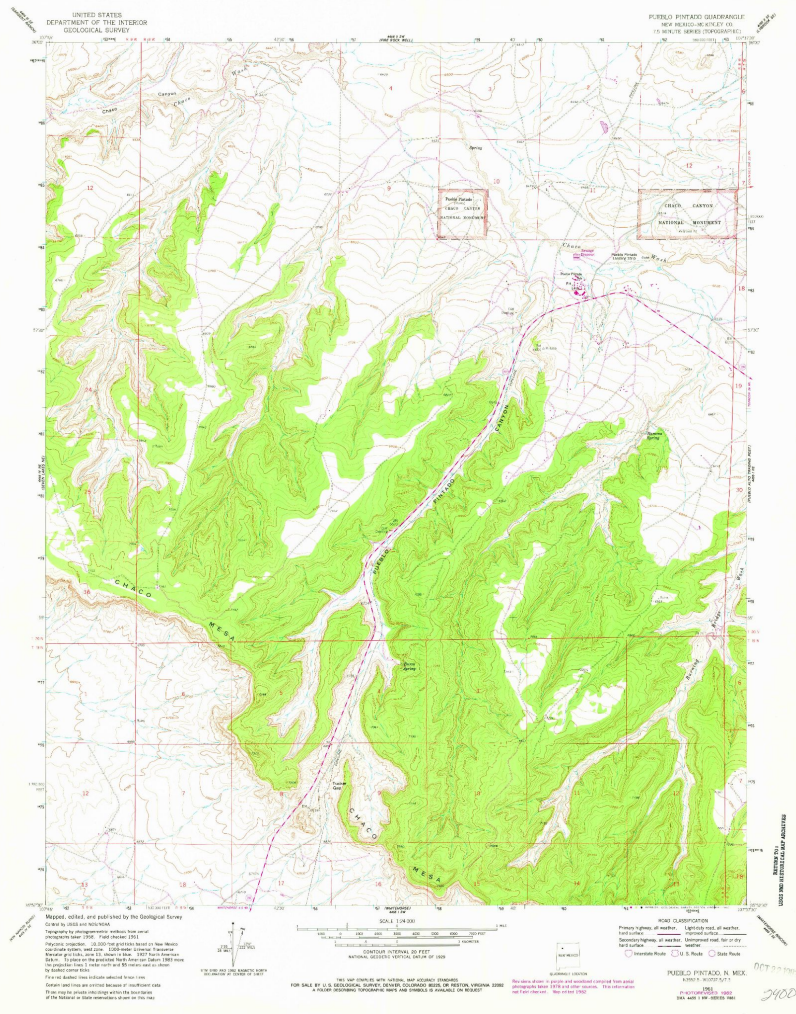
HYDROGRAPHY – continued	
Intermittent Lake	
Perennial Lake	
Levee	
Lock Chamber/Spillway	
Ocean	
Pipeline	
Underground Pipeline	
Playa	
Settling Pond	
Tailings Pond	
Rapids	
Reef	
Reservoir	
Nonearthen Reservoir	
Rock	
Nonearthen Shore	
Spring	
Intermittent Stream	
Perennial Stream	
Submerged Stream	
Tunnel	
Wash	
Waterfall	
Well	
Wetland Features	
Freshwater Emergent Wetland	
Freshwater Forested/Shrub Wetland	
TERRAIN	
Shaded Relief	
Shaded Relief	

Contour Features	
Index	
Intermediate	
Supplemental	
Depression Index	
Depression Intermediate	
Depression Supplemental	
LAND COVER	
Woodland	
IMAGES	
Orthoimage	
BOUNDARIES	
Designated Areas	
National Wild and Scenic Rivers	
Federal Administered Lands	
American Indian, Alaska Native, and Native Hawaiian Area	
Bureau of Land Management* National Park Service U.S. Fish and Wildlife Service U.S. Forest Service	
Department of Defense National Cemetery	
National Monument	
Wilderness Area	
Jurisdictional Boundaries	
County or Equivalent	
State or Territory	
International	
*Currently on Alaska US Topo maps only	
PLSS	
Land Grants	
Section	
Section (protracted)	
Township/Range	
Township/Range (protracted)	

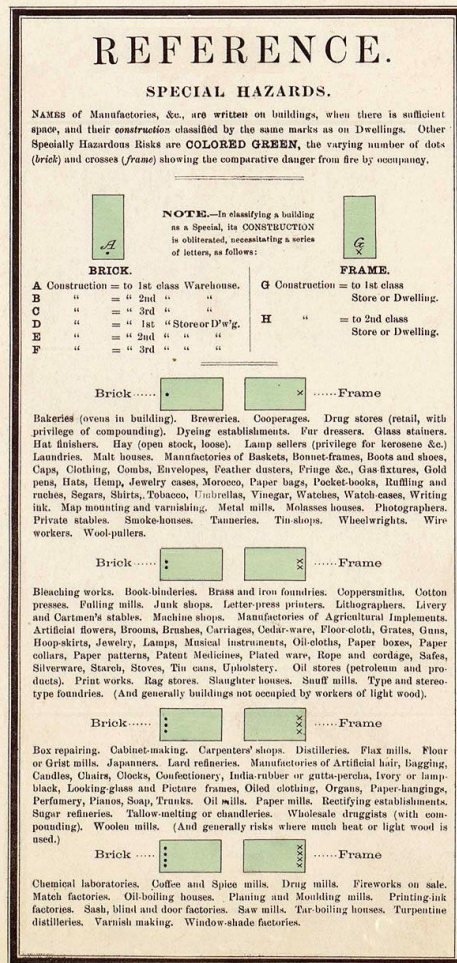
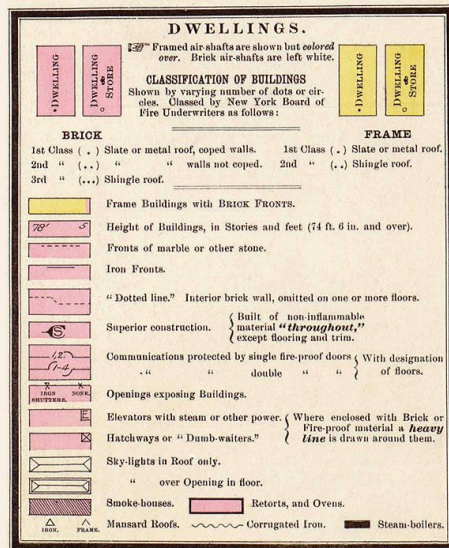
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symbol libraries

united states
geological survey map
symbols

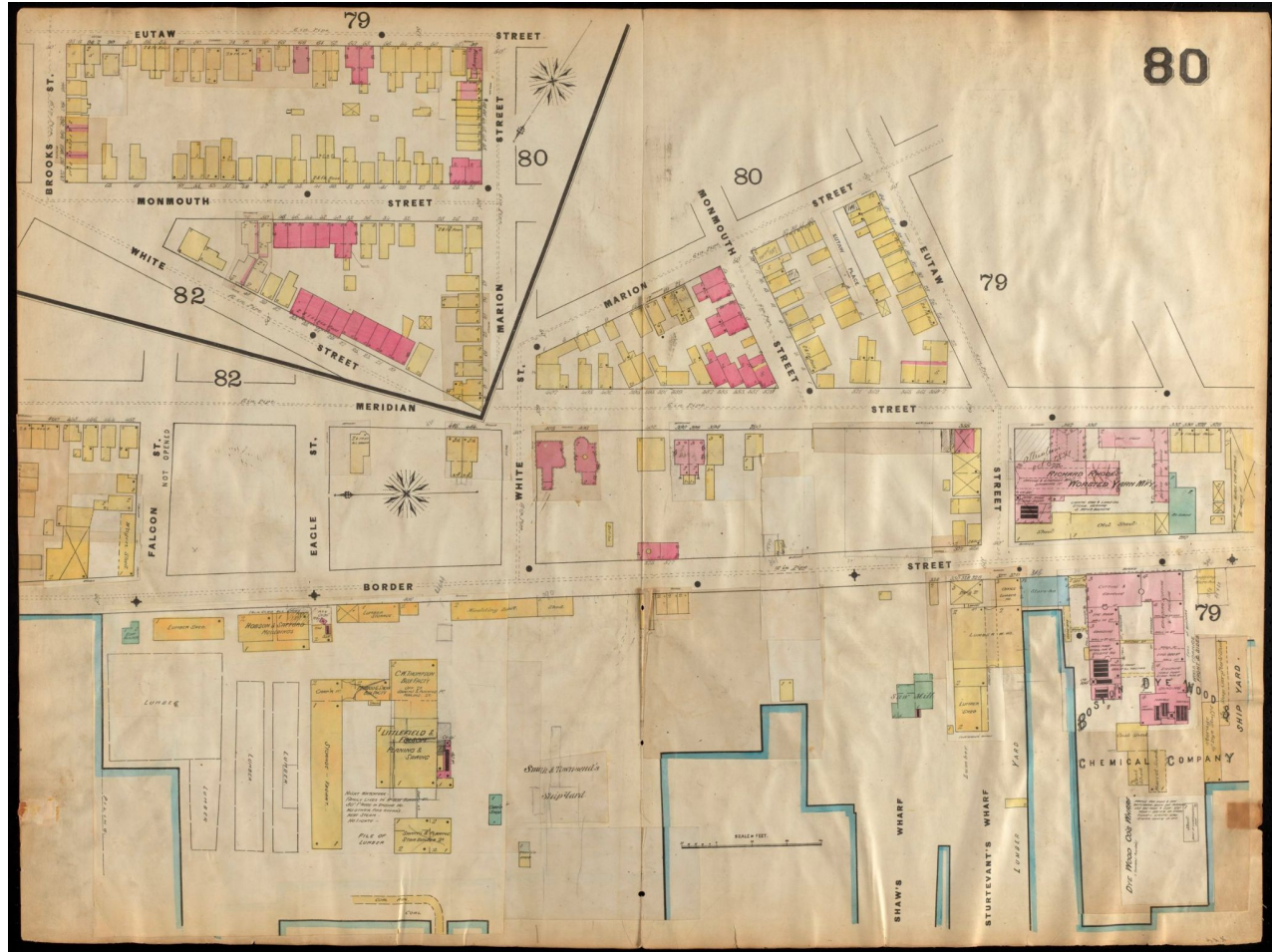


sanborn map
company reference,
key, and legend



symbol libraries

sanborn map
company reference,
key, and legend



symbol libraries

[Maki](#) icon set by
Mapbox



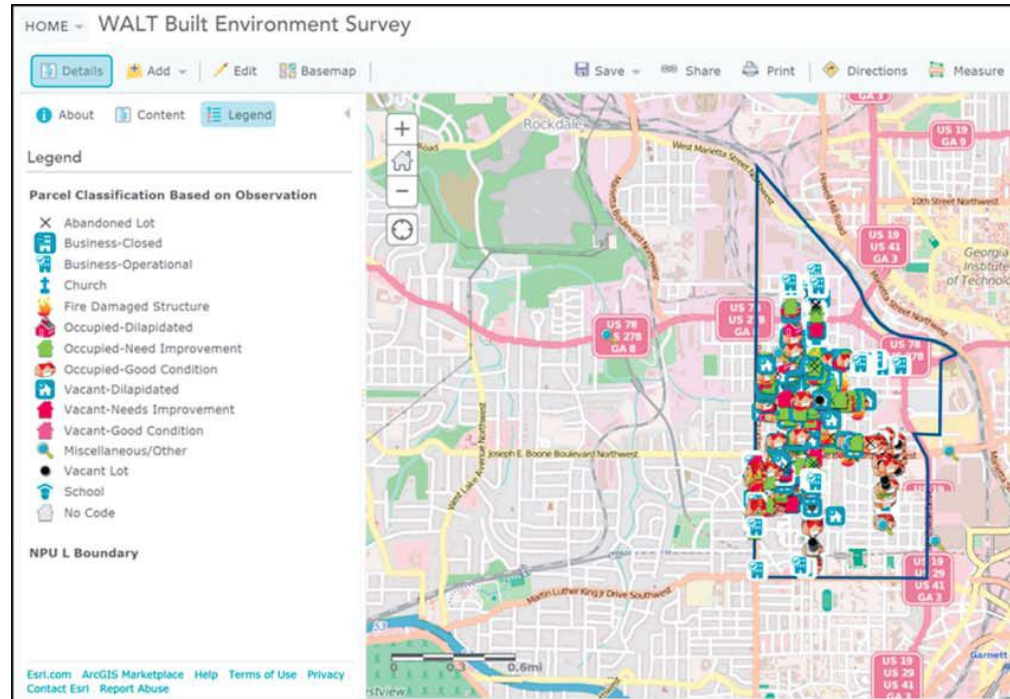
symbol libraries

Bosse and Hankins'
on cartographic
efficacy

"These Maps Talk for Us:" Participatory Action Mapping as Civic Engagement Practice

Amber J. Boll-Bosse
University of Kentucky

Katherine B. Hankins
Georgia State University



symbol libraries

*Bosse and Hankins’
on [cartographic
efficacy](#)*

“These Maps Talk for Us:” Participatory Action Mapping as Civic Engagement Practice

Amber J. Boll-Bosse
University of Kentucky

Katherine B. Hankins
Georgia State University

The members of WALT saw these maps as representations of their truths. The test of the ability of these maps to communicate the residents’ concerns is to ask this: What do these maps mean to non-WALT members? Are they accepted as legitimate representations of the neighborhoods? Do they inspire action? According to the reports shared by members of WALT during advisory board meetings, the answers are overwhelmingly “yes.”

*Meghan Kelly's
gallery of possibilities*

Thank you all!!

-mk

The mind map is a complex web of ideas centered around a grid of icons. It branches out into several main categories, each represented by a different color and containing various icons and handwritten notes:

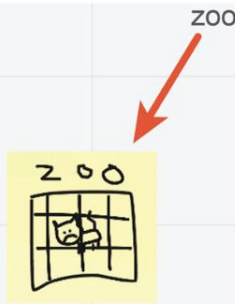
- Toilet:** A section at the top left featuring a drawing of a toilet and the word "toilet".
- Bicycle:** A section on the left side featuring a drawing of a bicycle and the word "Bicycle".
- Slaughterhouse:** A section at the bottom center featuring a drawing of a pig and the words "SLAUGHTERHOUSE" and "RIDDLE".
- Riddle:** A section on the right side featuring a drawing of a cat and the word "RIDDLE".
- Slaughterhouse Riddle:** A section at the bottom right featuring a drawing of a pig and the words "SLAUGHTERHOUSE RIDDLE" and "(THE KILLER OFFER CHASE VARIATION)".

The central grid contains numerous small icons, including animals, objects, and symbols, which are connected to the surrounding branches by lines. The overall theme appears to be a collection of riddles or puzzles related to these specific topics.

symbol libraries

Meghan Kelly's
[gallery of possibilities](#)

f.



here, trying to challenge power dynamics and problematic binaries between humans/non humans - showing animal in cage (not free like in the icon set).

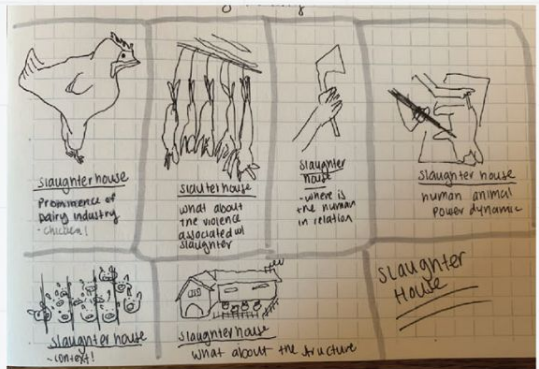
g.



women helping women

In Mexico we often use the slogan: "my friends look after me, not the police".

h.



slaughter house
Prominence of pairing industry - children!

slaughter house
what about the violence associated with slaughter?

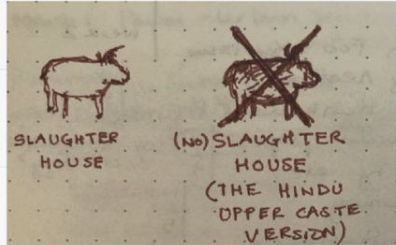
slaughter house
what about the human in relation

slaughter house
human animal power dynamics

slaughter house
what about the structure

slaughter house
concept!

i.



SLAUGHTER HOUSE

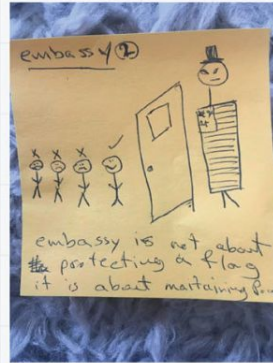
(NO) SLAUGHTER HOUSE
(THE HINDU UPPER CASTE VERSION)

this was meant to be a humorous take - the Indian government has banned the slaughter of cows (an upper caste Hindu ideology) so when I saw that the slaughterhouse was represented by a cow, I thought of what that would look like in India.

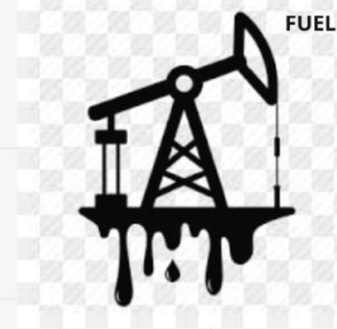
symbol libraries

Meghan Kelly's
[gallery of possibilities](#)

a.



b.



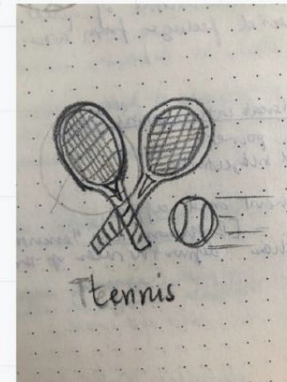
c.



d.



e.



Thought process:

- remove bodies that suggest specific gender, ability or body normativity.
- what are the minimal necessary elements to play tennis?
- maybe one racket would be enough?
- Also, thought of doing soccer first but couldn't draw a soccer ball.

gallery of possibilities reflection

independently, reflect on the Kelly article. you can read through it too if it's helpful! consider:

1. how did Kelly define feminist mapping?
2. what was the "gallery of possibilities?"
3. what kinds of power relationships structured maps you have made?
4. how were they symbolized?

1. study (5 mins)

in small groups, examine one of these icon sets posted on the course site:

- USGS
- IGL
- NPS
- Maki

and assess patterns that you find. how are geographic phenomena depicted? where do you notice people? what are their attributes? how do the icons conform to or deviate from **difference**, **resemblance**, **relation**, **convention**?

2. draw (10 mins)

pick a few of these icons and draw them – in a notebook, on the whiteboard, etc. – differently

include a short note explaining the choices you made