

cartography and design

foundations of geospatial analysis

2026.09.16

reminder

my office hours are
11-12 (Th) and 10-11 (F)

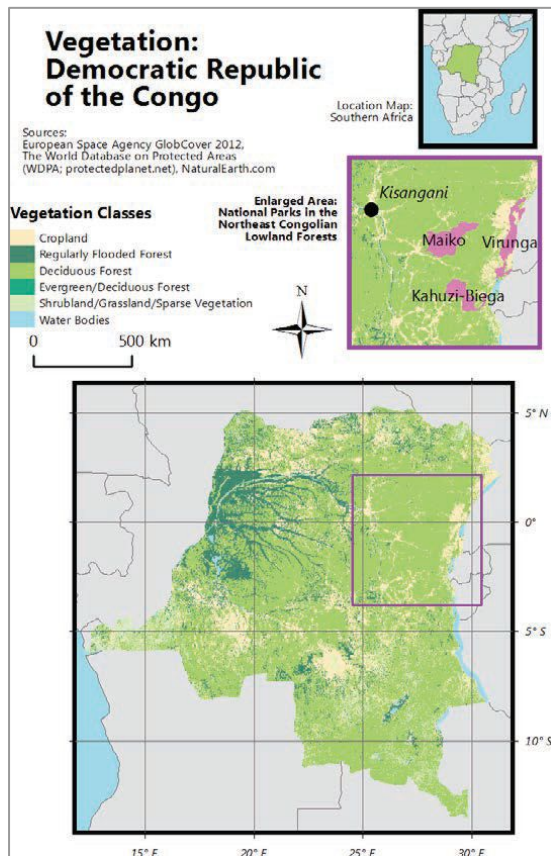
reminder

but SAL interns can help
you work on labs any day!

reminder

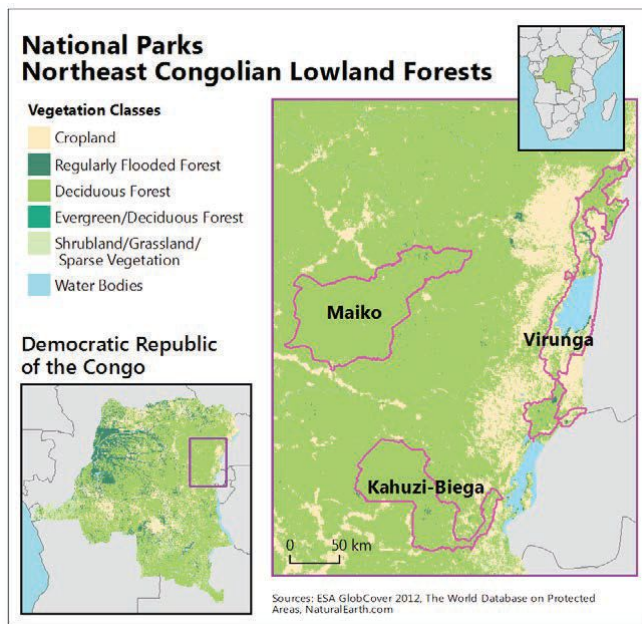
they are available 3-5
(M-Th) and 11-1 (F)

1

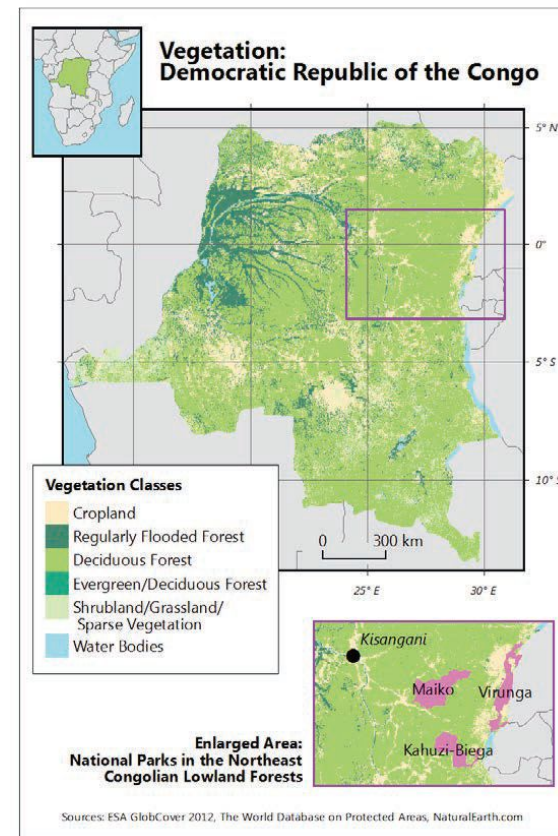


which one of these do you prefer?

2



3



map 2

National Parks Northeast Congolian Lowland Forests

Vegetation Classes

- Cropland
- Regularly Flooded Forest
- Deciduous Forest
- Evergreen/Deciduous Forest
- Shrubland/Grassland/
Sparse Vegetation
- Water Bodies

Democratic Republic of the Congo



Sources: ESA GlobCover 2012, The World Database on Protected Areas, NaturalEarth.com

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neatline around
map leaves
breathing room

clear title

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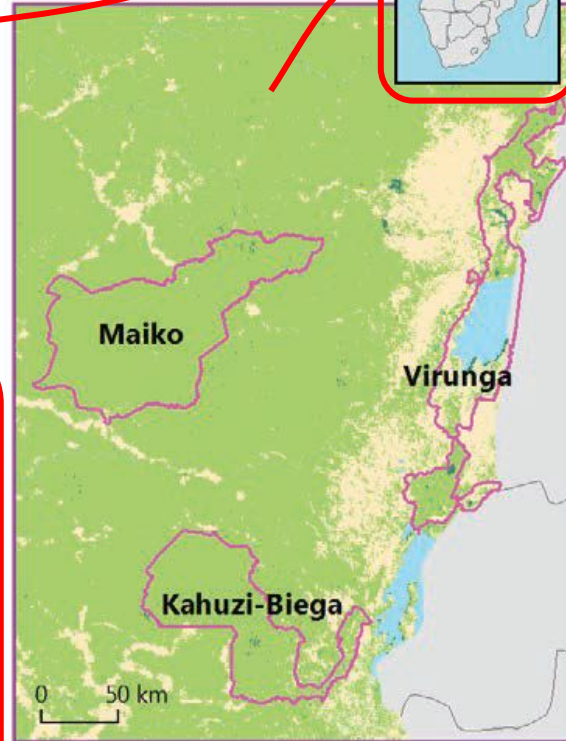
legend is
left-aligned
with other
features

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inset maps
clarify without
distracting

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“visual center”
(~5° above
“cartesian”
center) of image
contains
meaningful
information

in general there is
empty space
between features,
giving everything
room to breathe

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**is this map
perfect?**

**is this map
perfect?
no, it is not
perfect**

**it helps highlight
that people tend to
agree on what kinds
of designs look
better**

**... but, you
shouldn't assume
that "better"
design is universal**

map design & elements of the map

goals of map design

clarity: emphasize important points, eliminate or remove things that don't emphasize

order: logic of the map. is there clutter? how is it oriented (X or Y axis)?

balance: place weight at optical center of map (5% above Cartesian center).

contrast: how are you utilizing difference? bright/dark, thick/thin, heavy/light.

unity: how are you building your map elements into a cohesive purpose?

harmony: how are the elements of your map working together visually?

elements of the map

main map	graticule (lines of latitude and longitude)
smaller-scale location map	extent indicators
inset maps showing detail	explanatory notes
insets of locations outside main map	source note
title	publisher credit and copyright notice
subtitles	author credit
legends	neatline
scale indicators	additional graphics (photos, graphs)
orientation indicators	

some of these are more important than others

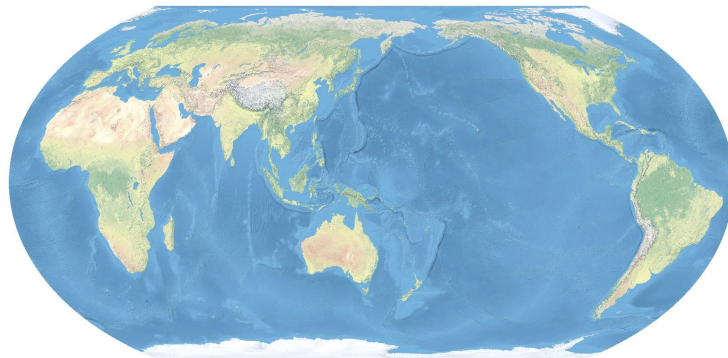
main map	graticule (lines of latitude and longitude)
smaller-scale location map	extent indicators
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scale indicators	additional graphics (photos, graphs)
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and many are not so important at all!

~~main map~~	~~graticule (lines of latitude and longitude)~~
~~smaller-scale location map~~	~~extent indicators~~
~~inset maps showing detail~~	~~explanatory notes~~
~~insets of locations outside main map~~	~~source note~~
~~title~~	~~publisher credit and copyright notice~~
~~subtitles~~	~~author credit~~
~~legends~~	~~headline~~
~~scale indicators~~	~~additional graphics (photos, graphs)~~
~~orientation indicators~~	

case study: the north arrow

[put a north arrow on it](#), by John Nelson



In the hyper-technical world of cartography one must often endure a no-holds-barred review session where a map is scrutinized against a time-tested checklist of must-haves.

Title? Check.

Scalebar? Check.

Legend? Check.

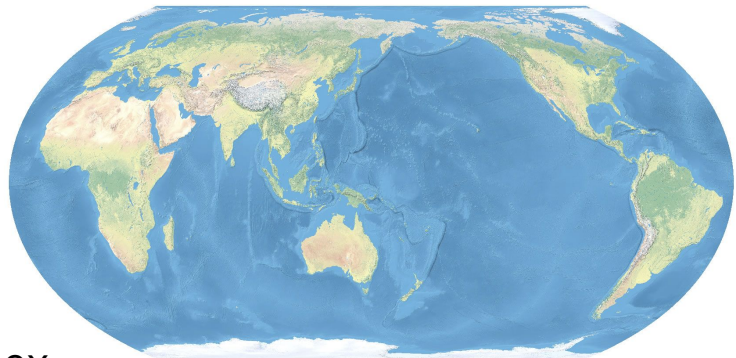
North arrow? Check.

Only then is it an acceptable spatial document worthy of the masses...

...except not really.

A really great map can have any, or none, of those things. We'll focus on the illustrious north arrow. Do you always need to put a north arrow on a map? [No way](#). In fact, frequently you should *not* put a north arrow on a map. Here are a handful of examples, and how north-arrow worthy they are.

a north arrow should...



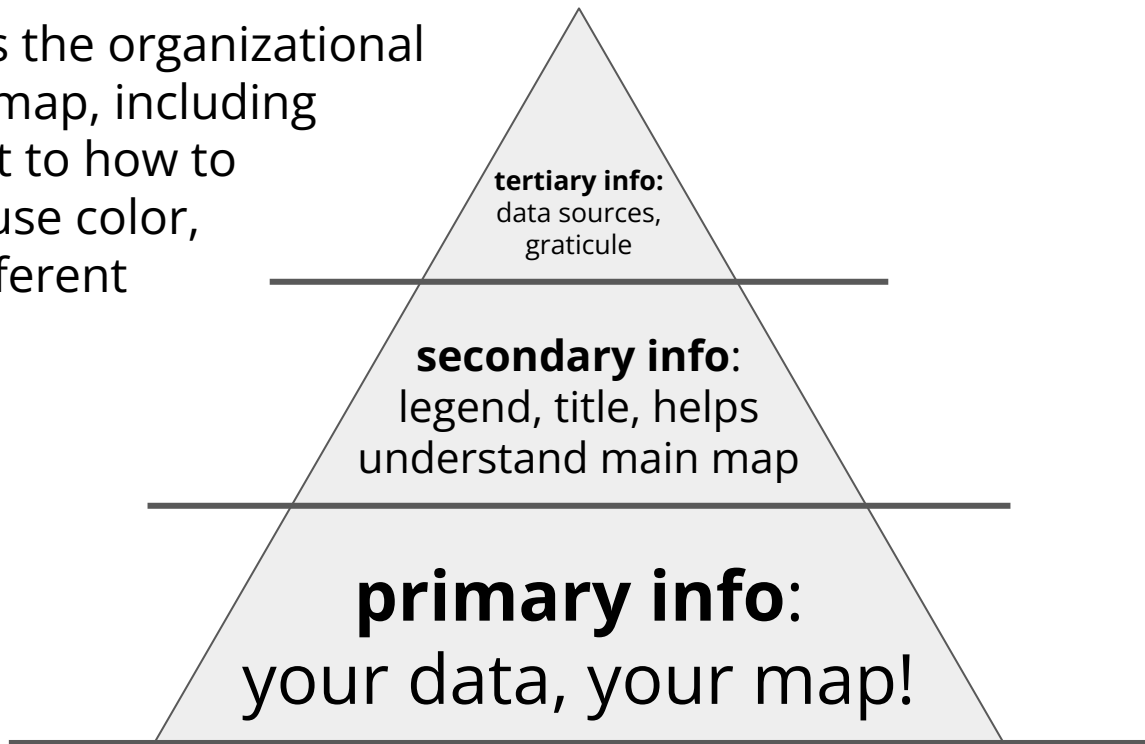
- be a considered addition, not a dogmatic reflex
- compliment the map's visual design
- probably be a lot smaller and simpler than you might think
- graticules (latitude/longitude grid) can often replace a north arrow, and they look cool
- consider making your own branded SVG or PNG north arrow

intellectual & visual hierarchy

intellectual hierarchy

adapted from [axismaps](#)

this describes the organizational logic of your map, including choices about to how to label things, use color, and apply different sizes to fonts



intellectual hierarchy

from [gistbok](#)

rank	static map elements	interactive map elements
1	thematic symbols	title/splash screen
2	title/legend/map symbols/labels	symbolology, key reference data, info windows (opened)
3	base map: land areas, political boundaries, physical features	base map, base map labels, navigation tools
4	explanatory materials: sources, credits	map interactivity, pan/zoom/selection tools, print/share features
5	base map: water features	locator maps, charts/graphs, multimedia supplements
6	other base map elements: labels, grids, scales	supplemental info, attributions, copyright, neatlines/grid/graticule, tool tips

the *intellectual hierarchy* **that**
you define will translate into
a *visual hierarchy* **that you**
design

visual hierarchy

*old woman or young
woman?*



visual hierarchy

this describes the organization of design such that some things seem more important, and others less so

unless you want to create an optical illusion, show a clear distinction between the **figure** and the **ground**



visual hierarchy

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unless you want to create an optical illusion, show a clear distinction between the **figure** and the **ground**

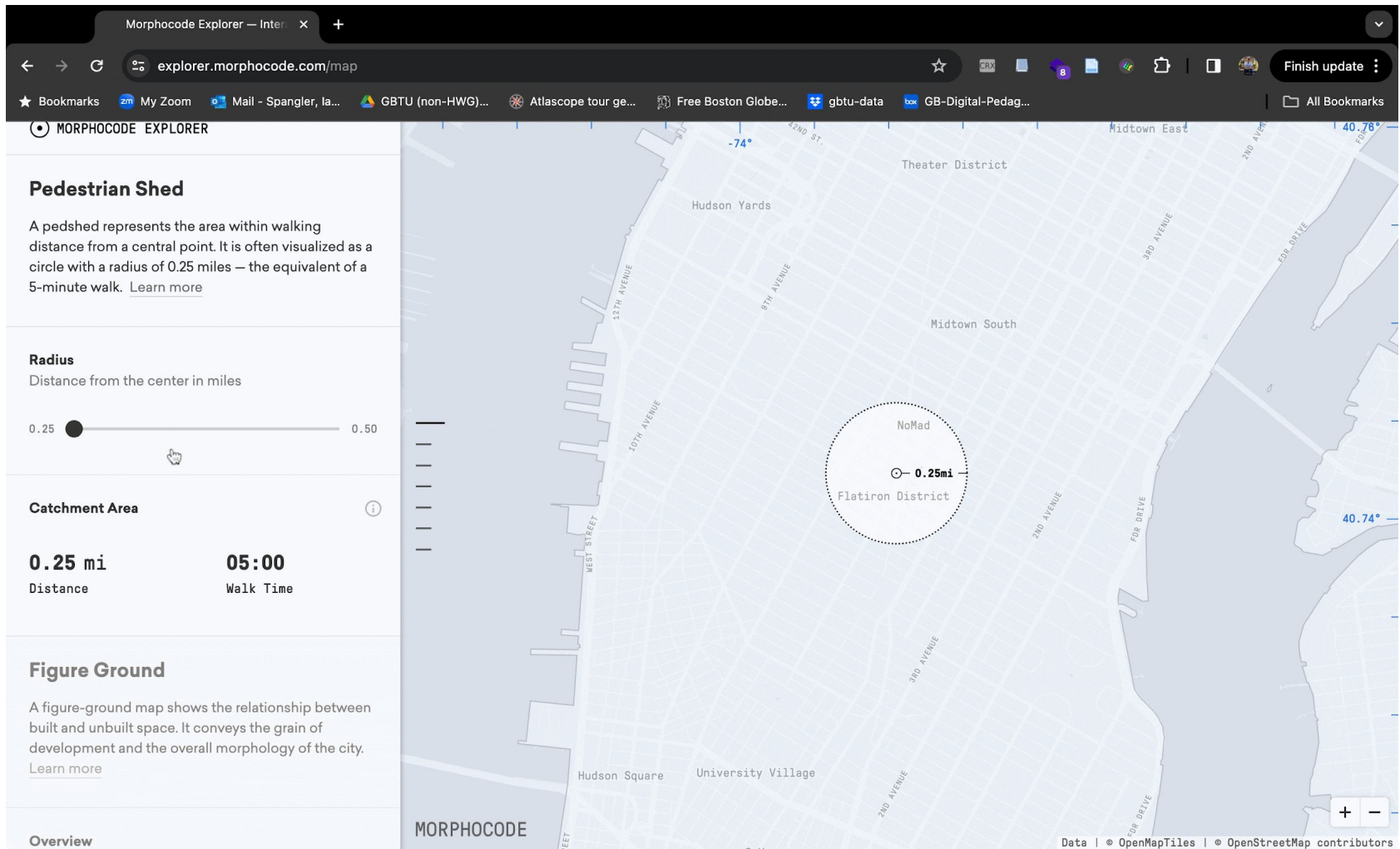


**this is called the
figure-ground
relationship**



this map of new york city in 1895
cleverly uses figure-ground and
color to make an argument
about urban politics





visual hierarchy

the map on the top uses color choices (e.g., darker fonts, blue water) to create figure-ground effects through contrast



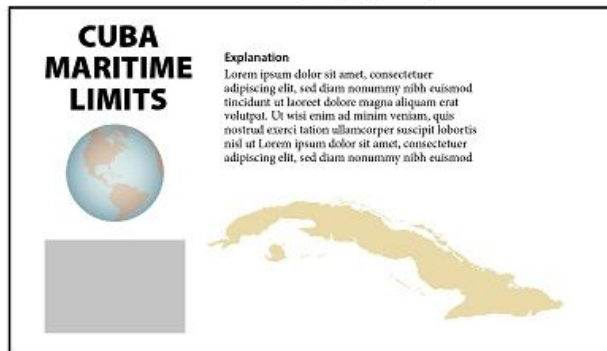
from [axismaps](https://axismaps.com)

visual hierarchy

comparison of the same map, designed differently in four ways

from [gistbok](#)

A. Poor balance and white space; tips left, not unified



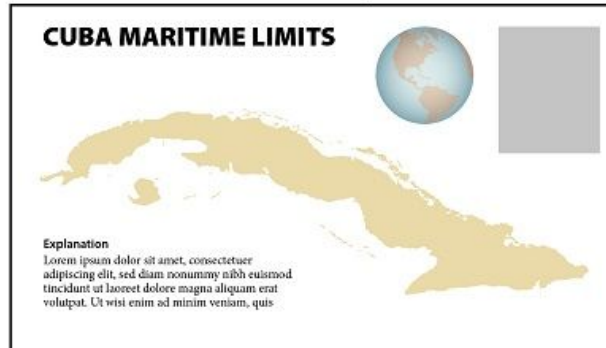
B. Poor balance and white space; bottom heavy, big hole



C. Better balance and white space; tips right, crowded



D. Much better balance and white space



fonts and letters

**LIVERPOOL STREET, FENCHURCH STREET, STRATFORD,
ILFORD, ROMFORD, BRENTWOOD, SHENFIELD AND CHELMSFORD.**

(For trains on Saturdays see pages 63 to 68.)

[illegible]

D Calls at Stratford to take up passengers only.
F Calls at Ilford to take up passengers only.

Second class carriages are not run on these trains

MONDAYS TO FRIDAYS INCLUSIVE
(For trains on Saturdays see pages 63 to 69)

			S S										S S		P		S S						R		R					
			a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	N	a.m.	a.m.	a.m.	S S	P	S S	P	a.m.	p.m.	p.m.	p.m.	p.m.	R	R	p.m.	p.m.	p.m.	
LIVERPOOL STREET dep.			1034	10 46	1045	1049	1111	1110	1125	1130	1137	1142	1153	1156	12 0	12 3	12 5	1219	1225	1233	1242	1246								
Bethnal Green — — — — —			1038	1049	1114	1118	1141	1145	1153	1156	12 0	12 3	12 5	1219	1225	1233	1242	1246												
Coborn Road for Old Ford			1042	1053	1111	1118	1141	1145	1153	1156	12 0	12 3	12 5	1219	1225	1233	1242	1246												
FENCHURCH STREET — dep.			1030	1032	1034	1037	1039	1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	
Leman Street			1032	1034	1037	1039	1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	11 54	
Shadwell and St. George's East ..			1034	1037	1039	1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	11 54	11 56	
Stepney (East)			1037	1039	1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	11 54	11 56	11 58	
Burdett Road			1039	1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	11 54	11 56	11 58	12 0	
Bow Road			1043	11 5	11 8	11 10	11 12	11 15	11 17	11 21	11 25	11 28	11 30	11 32	11 34	11 36	11 38	11 40	11 42	11 44	11 46	11 48	11 50	11 52	11 54	11 56	11 58	12 0	12 2	
Stratford Market arr.			1046	1049	1057	1059	1120	1123	1126	1134	1149	1152	1203	1210	1217	1224	1231	1238	1245	1252	1259	1306	1313	1320	1327	1334	1341	1348	1355	
Stratford dep.			1050	1052	1055	1058	11 2	11 5	11 8	11 11	11 14	11 17	11 20	11 23	11 26	11 29	11 32	11 35	11 38	11 41	11 44	11 47	11 50	11 53	11 56	11 59	12 0	12 3	12 6	
Maryland Point			1052	1055	1058	11 2	11 5	11 8	11 11	11 14	11 17	11 20	11 23	11 26	11 29	11 32	11 35	11 38	11 41	11 44	11 47	11 50	11 53	11 56	11 59	12 0	12 3	12 6	12 9	
Forest Gate for Upton			1055	1058	11 2	11 5	11 8	11 11	11 14	11 17	11 20	11 23	11 26	11 29	11 32	11 35	11 38	11 41	11 44	11 47	11 50	11 53	11 56	11 59	12 0	12 3	12 6	12 9	12 12	
Manor Park for Little Ilford ..			1058	11 2	11 5	11 8	11 11	11 14	11 17	11 20	11 23	11 26	11 29	11 32	11 35	11 38	11 41	11 44	11 47	11 50	11 53	11 56	11 59	12 0	12 3	12 6	12 9	12 12	12 15	
Ilford			11 2	11 5	11 8	11 11	11 14	11 17	11 20	11 23	11 26	11 29	11 32	11 35	11 38	11 41	11 44	11 47	11 50	11 53	11 56	11 59	12 0	12 3	12 6	12 9	12 12	12 15	12 18	
Seven Kings			11 6	11 9	11 13	11 17	11 21	11 25	11 28	11 31	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	
Goodmayes			11 9	11 13	11 17	11 21	11 25	11 28	11 31	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	
Chadwell Heath for Becontree ..			11 11	11 15	11 19	11 23	11 27	11 30	11 33	11 36	11 39	11 42	11 45	11 48	11 51	11 54	11 57	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	
Romford			11 13	11 17	11 21	11 25	11 28	11 31	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	
Gidea Park and Squirrels Heath ..			11 17	11 21	11 25	11 28	11 31	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	
Harold Wood			11 21	11 25	11 28	11 31	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	12 39	
Brentwood and Warley			11 30	11 34	11 37	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	12 39	12 42	12 45	12 48	
Shenfield and Hutton			11 36	11 40	11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	12 39	12 42	12 45	12 48	12 51	12 54	
Ingatstone			11 43	11 46	11 49	11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	12 39	12 42	12 45	12 48	12 51	12 54	12 57	13 0	
CHELMEFORD arr.			11 52	11 55	11 58	12 0	12 3	12 6	12 9	12 12	12 15	12 18	12 21	12 24	12 27	12 30	12 33	12 36	12 39	12 42	12 45	12 48	12 51	12 54	12 57	13 0	13 3	13 6	13 9	

B Calls to take up passengers only
C Calls to set down passengers only
N Not after 29th September

P Commences 2nd October
R Runs Fridays 15th, 22nd and 29th September only
S S Second class carriages are not run on these trains

TABLE 13—continued

56

LIVERPOOL STREET, FENCHURCH STREET, STRATFORD, ILFORD,
ROMFORD, BRENTWOOD & WARLEY, SHENFIELD & HUTTON AND CHELMSFORD

MONDAYS TO FRIDAYS INCLUSIVE
(For trains on Saturdays see pages 63 to 69)

			S	S								N				SS	P	SS	P					R	R			
		a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	a.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.	p.m.
LIVERPOOL STREET	dep.	1034	1046	1045	1049	1111	1110	1112	1130	1137	1142	1153	1156	12 0	12 3	12 5	1219	1225	1233	1237	1241	1242	1246	1252	1253	1255	1258	
Bethnal Green	"	1038	1049	1053	1114	1118	1141	1145	1154	12 1	12 3	1215	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	
Coborn Road for Old Ford	"	1042	1053	1118	1145	1154	12 1	12 3	1215	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	1334	1338	
FENCHURCH STREET	dep.	1038	1049	1053	1114	1118	1141	1145	1154	12 1	12 3	1215	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	
Leman Street	"	1039	1050	1054	1115	1119	1142	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	
Shadwell and St. George's East	"	1039	1050	1054	1115	1119	1142	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	
Stepney (East)	"	1039	1050	1054	1115	1119	1142	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	
Burdett Road	"	1039	1050	1054	1115	1119	1142	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	
Bow Road	"	1043	1054	1119	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	1333	1337	1341	
Stratford Market	"	1043	1054	1119	1146	1155	12 2	12 4	1216	1218	1225	1231	1235	1250	1253	1256	1300	1305	1309	1312	1315	1321	1325	1329	1333	1337	1341	
Stratford	"	1052	1103	1107	1120	1124	1130	1138	1155	1210	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	1334	
Maryland Point	"	1052	1103	1107	1120	1124	1130	1138	1155	1210	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	1334	
Forest Gate for Upton	"	1055	1106	1110	1123	1127	1133	1141	1158	1213	1220	1227	1233	1237	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	1334	1338	
Manor Park for Little Ilford	"	1058	1109	1113	1126	1130	1136	1144	12 1	12 3	1240	1246	1250	1305	1309	1313	1316	1322	1326	1330	1334	1338	1342	1346	1350	1354	1358	
Ilford	"	11 2	1113	1117	1130	1134	1140	1149	12 6	12 8	1210	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	
Seven Kings	"	11 6	1117	1121	1134	1138	1140	1149	12 6	12 8	1210	1217	1224	1230	1234	1249	1252	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	
Goodmayes	"	11 9	1120	1124	1137	1141	1143	1152	12 9	12 11	1212	1219	1226	1232	1236	1251	1254	1257	1300	1305	1309	1312	1315	1321	1325	1329	1333	
Chadwell Heath for Becontree	"	11 11	1122	1126	1139	1143	1145	1154	12 11	12 13	1214	1221	1228	1234	1238	1253	1256	1259	1302	1307	1311	1314	1317	1323	1327	1331	1335	
Romford	"	11 13	1124	1128	1141	1145	1147	1156	12 13	12 15	1216	1223	1230	1236	1240	1255	1258	1301	1306	1310	1313	1316	1322	1326	1330	1334	1338	
Gidea Park and Squirrels Heath	"	11 17	1128	1132	1145	1149	1151	12 0	12 12	12 14	1218	1225	1232	1238	1242	1257	1300	1303	1306	1309	1312	1315	1321	1325	1329	1333	1337	
Harold Wood	"	11 21	1132	1136	1149	1153	1155	12 4	12 16	12 18	1222	1229	1236	1242	1246	1301	1304	1307	1310	1313	1316	1322	1326	1330	1334	1338	1342	
Brentwood and Warley	"	11 30	1141	1145	1158	12 0	12 0	12 4	12 16	12 18	1222	1229	1236	1242	1246	1301	1304	1307	1310	1313	1316	1322	1326	1330	1334	1338	1342	
Shenfield and Hutton	"	11 36	1147	1151	12 0	12 4	12 4	12 8	12 20	12 22	1226	1233	1240	1246	1250	1305	1308	1311	1314	1317	1320	1326	1330	1334	1338	1342	1346	
Ingatstone	"	11 43	1154	1158	12 1	12 5	12 5	12 9	12 21	12 23	1227	1234	1241	1247	1251	1306	1309	1312	1315	1318	1321	1327	1331	1335	1339	1343	1347	
CHELMSFORD	arr.	11 52	12 03	12 07	12 20	12 24	12 26	12 35	12 37	12 41	1244	1251	1258	1304	1308	1312	1315	1318	1321	1324	1327	1333	1337	1341	1345	1349	1353	

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R Runs Fridays 13th, 22nd and 29th September only
S S Second class carriages are not run on these trains

At State Dept., a Typeface Falls Victim in the War Against Woke

Secretary of State Marco Rubio called the Biden-era move to the sans serif typeface “wasteful,” casting the return to Times New Roman as part of a push to stamp out diversity efforts.



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377

At State Dept., a Typeface Falls Victim in the War Against Woke

Secretary of State Marco Rubio called the Biden-era move to the sans serif typeface “wasteful,” casting the return to Times New Roman as part of a push to stamp out diversity efforts



By Michael Crowley and Hamed Aleaziz

Reporting from Washington

Dec. 9, 2025

Secretary of State Marco Rubio waded into the surprisingly fraught politics of typefaces on Tuesday with an order halting the State Department’s official use of Calibri, reversing a 2023 Biden-era directive that Mr. Rubio called a “wasteful” sop to diversity.

serif

Usually reserved for
natural features

Implies tradition, dignity,
and solidity

*Italics indicate motion,
such as in a river*

sans serif

Usually reserved for
human-made features

Implies newness, precision,
and authority

*Italics indicate motion,
such as on a road*

Avoid using **MORE** *than* **two** typefaces

Watch out for **over-bolding** and SHOUTING

consider font size **discipline**

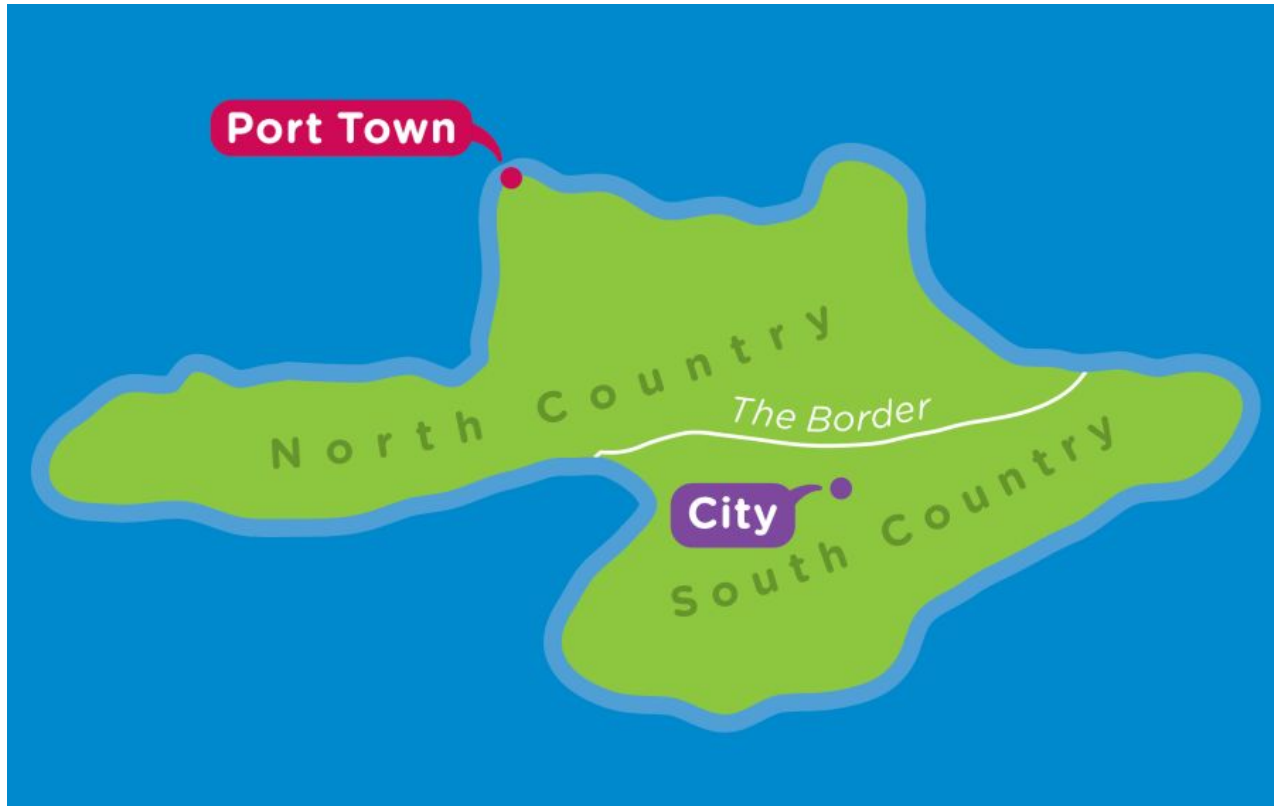
don't underline 😁

the only difference between these two maps is the font. some considerations:

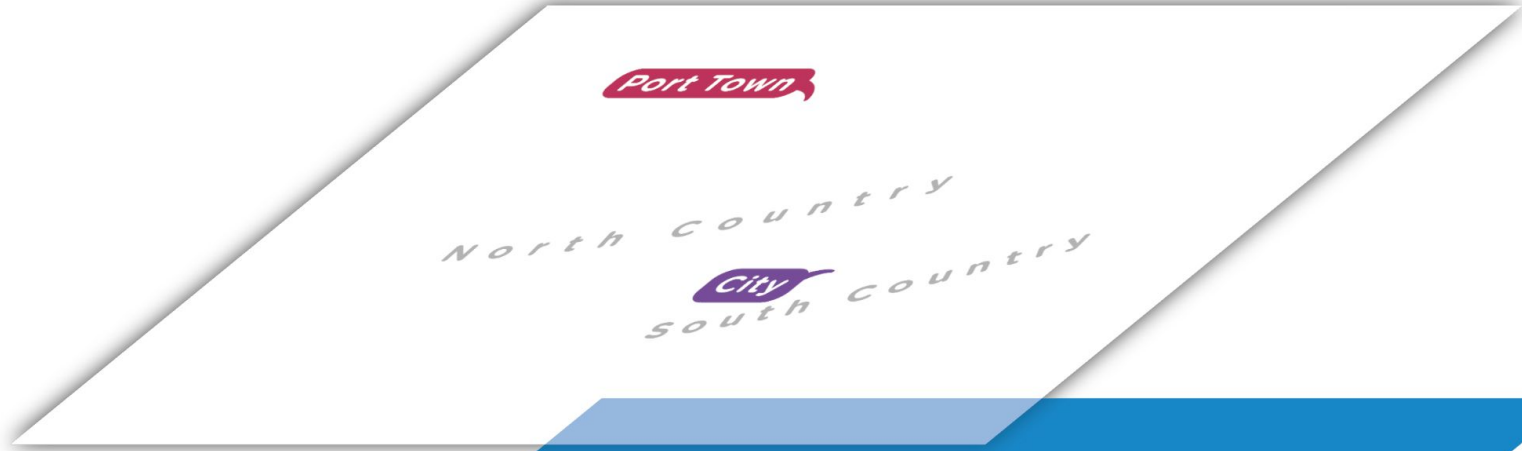
- the typeface must be legible in small sizes
- typeface should be narrow
- different styles and weights of the typeface must be clearly differentiated
- individual letters should appear different from one another



labeling



Layout Layer



Geographic Layer

Labeling Point Data

When labeling point symbols on a map, start at the center of the map and work outward. For each symbol, follow these priorities, where 1 is best, 8 is worst.

2	1
6	5
4	3
7	
8	

Show characteristics of the labeled location with type placement.

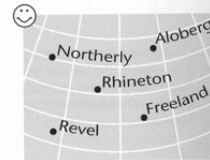
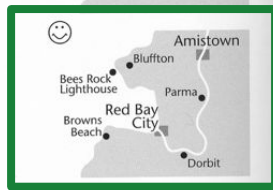
Label ports and harbor towns on the sea

Label inland towns on the land

Label land features on land; water features on water

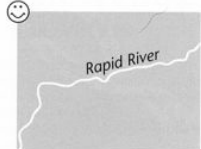
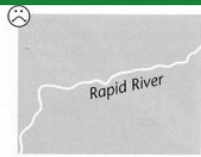
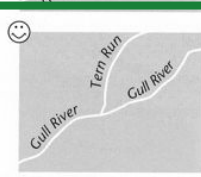
Label towns on the side of the river on which they are located

Align type to grid (latitude) if grid is included

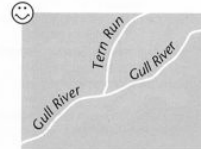
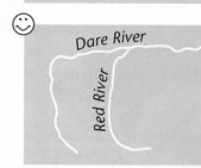
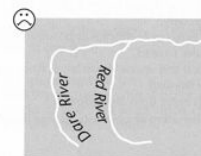


Labeling Line Data

Curve or slant type, following symbol
Keep type above symbol if possible
Keep type as horizontal as possible for ease of reading



Never place type upside-down
With vertical type, place the first letter of the label at the bottom
Repeat rather than stretch type



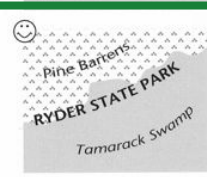
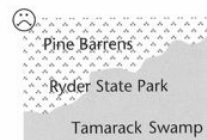
Labeling Area Data

Curve and space type to fit areas. Ensure that the area and the label are clearly associated.

Entire area label should follow a gentle and smooth curve
Keep area labels as horizontal as possible (they are easier to read)
Avoid vertical and upside-down labels (they are harder to read)
Keep labels away from area edges
Avoid hyphenating or breaking up area labels



Distinguish overlapping areas by varying type size, weight, form
Label linear areas like line symbols



titles

SOFTWARE, E-RESOURCE

Dataset of the 1861 railroad system in America

Historical GIS : the 1861 railroad system in America, 1861 dataset



Software or
E-Resource

[dataset]

Download: ZIP (1.6 MB) Go

Railroad network of the United States, 1870



Internet cableways, 100 years early



Internet cableways, 100 years early

"Eclectic and unpredictable, full of unexpected riffs."
—Hua Hsu, *The New Yorker*

A PREHISTORY OF THE CLOUD

Tung-Hui Hu

But the relatively recent gouges and tire marks in Ruwedel's photograph suggest that the railroad has not been swept aside entirely by new technologies. In fact, the relationship between old and new is a complicated one, because beneath the abandoned railroad bed from the nineteenth century lies fiber-optic cable, technology of the twenty-first century. In 1978, the track's owner, the Southern Pacific Railroad, realized that it could sell excess capacity on its network—heretofore used for internal communications, such as train signaling—to corporate customers. A few years later, the Southern Pacific spun off this telecommunications division, the Southern Pacific Railroad Internal Network; its new acronym was SPRINT. Around ten years later, it spun off a second company, Southern Pacific Telecommunications Company, later renamed Qwest, to run fiber beneath its rights-of-way. Together,

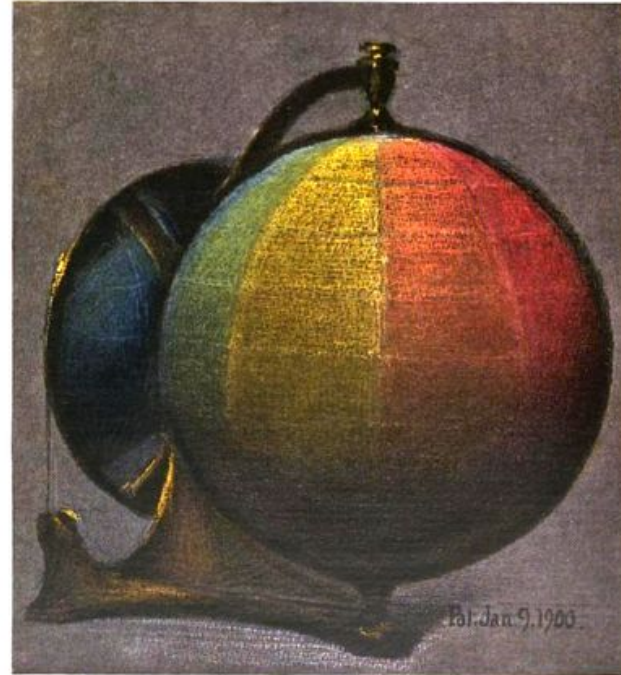
the corporate descendants of a single railroad company comprise two of the six major fiber-optic carriers of the US Internet (figure 1.2).³

color

Munsell's color sphere, c. 1900

munsell's color sphere highlights the three dimensions of color:

- **hue**: basic color (red, green)
- **saturation** (chroma): purity
- **value**: lightness

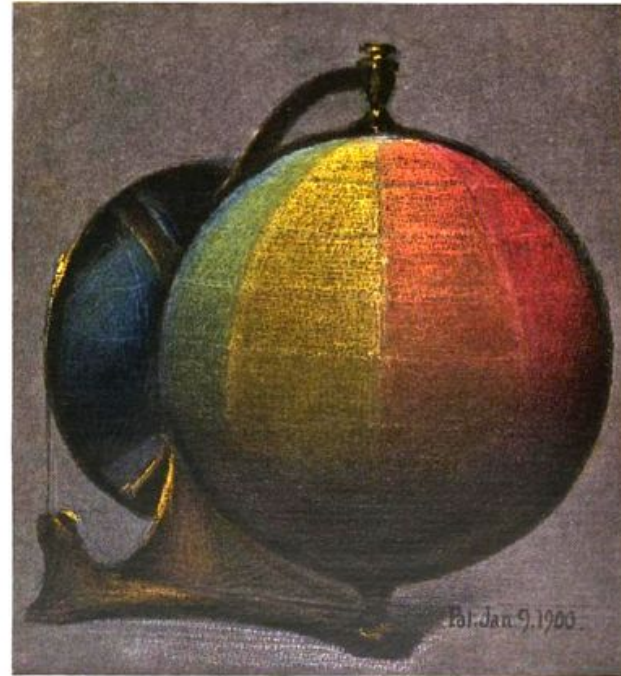


A BALANCED COLOR SPHERE

Munsell's color sphere, c. 1900

munsell's color sphere highlights the three dimensions of color:

- **hue:** basic color (red, green)
- **saturation** (chroma): purity
- **value:** lightness

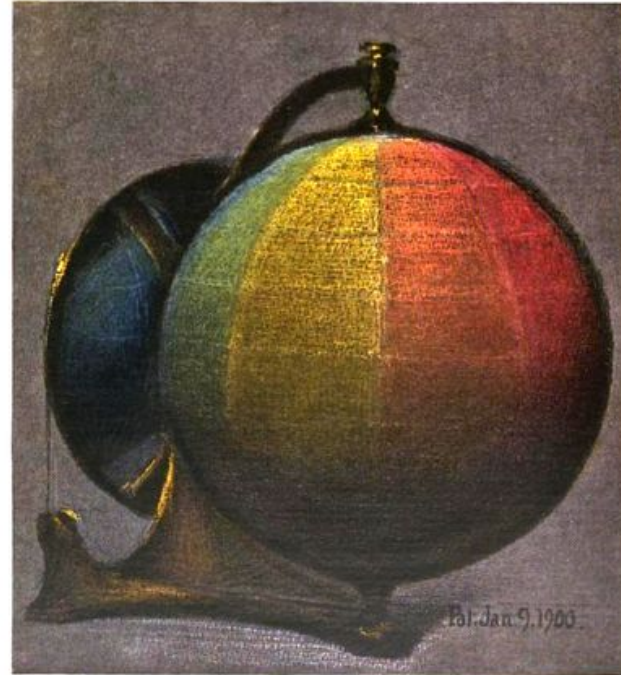


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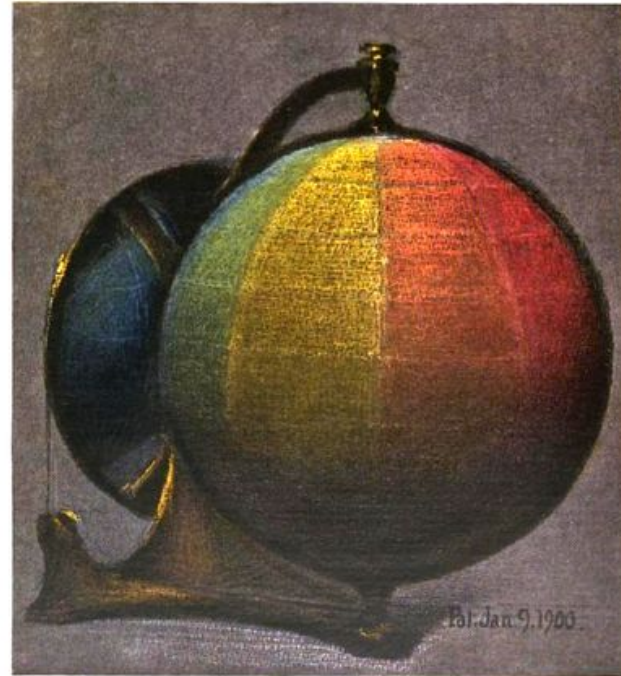
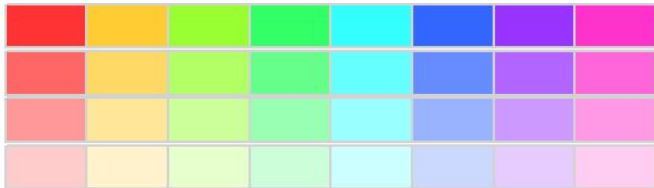


A BALANCED COLOR SPHERE

Munsell's color sphere, c. 1900

munsell's color sphere highlights the three dimensions of color:

- **hue**: basic color (red, green)
- **saturation** (chroma): purity
- **value**: lightness



A BALANCED COLOR SPHERE

Color Editor



Color Mode RGB ▾



Red

0 ▴ ▾



Green

209 ▴ ▾



Blue

214 ▴ ▾

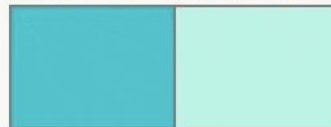


Transparency

0% ▴ ▾

Current

Previous



HEX # 00DBCC

Save color to style...

OK

Cancel

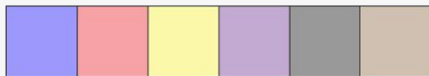
qualitative maps show
difference of *type*

quantitative maps show
difference of *magnitude*

qualitative maps

Categorical & Qualitative Mapping

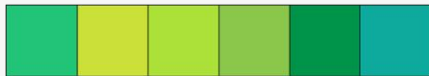
Multiple Hue, light tints
(good for overlaying additional features)



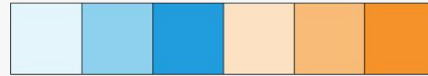
Multiple Hue, no tinting or shading
(not good for overlaying)



Analogous Scheme
(similar colors = similar features
e.g., vegetation type)



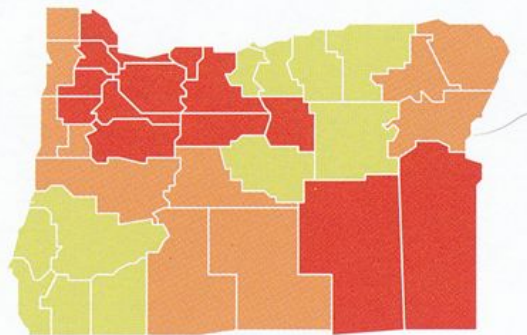
Complementary Scheme
(opposite color with varying tints
good for showing contrasting landuse)





qualitative colors (value)

Favorite Hotdog Condiment
Plurality Opinion, Oregon, 2009

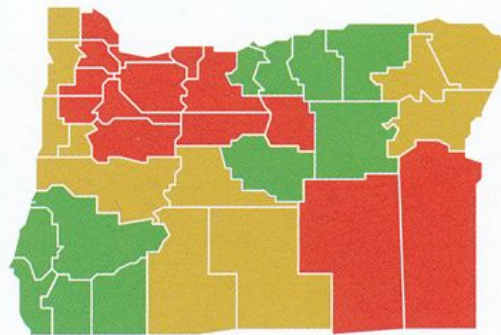


This value series suggests an order in the data that does not exist

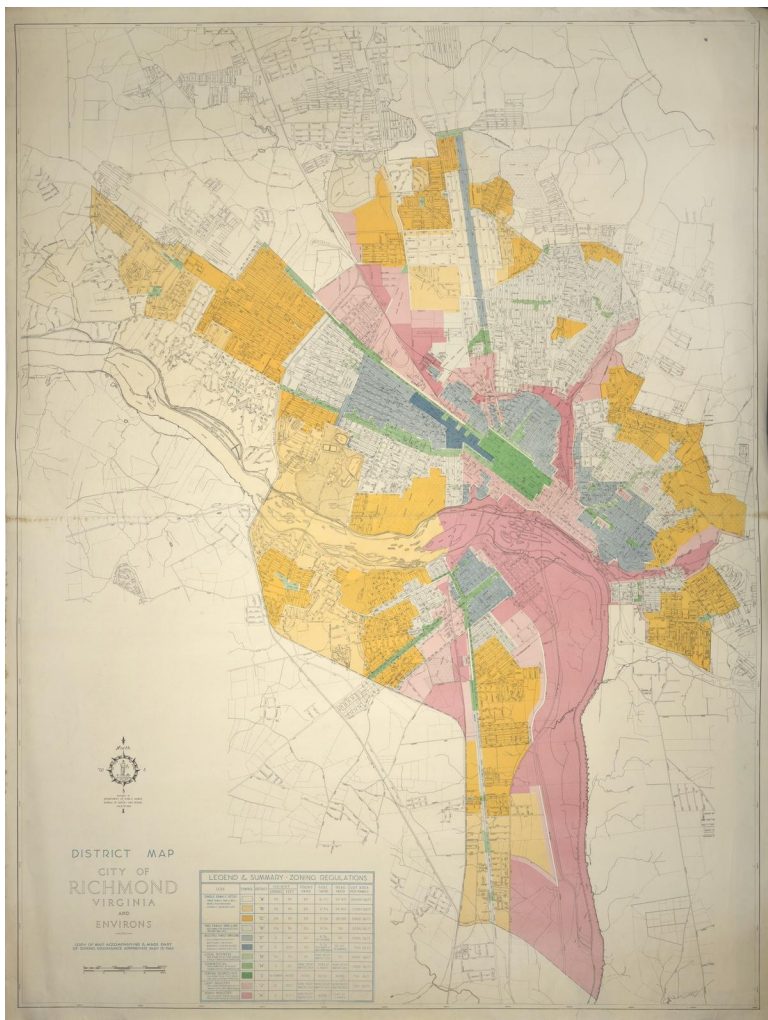


qualitative colors (hue)

Favorite Hotdog Condiment
Plurality Opinion, Oregon, 2009



Hues suggest no order and reflect actual condiment color

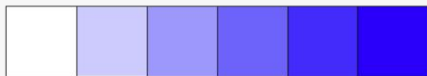


LEGEND & SUMMARY - ZONING REGULATIONS								
USE	SYMBOL	DISTRICT	HEIGHT		FOUNT YARD	SIDE YARD	REAR YARD	LOT AREA PER FAMILY
			STORIES	FEET				
SINGLE FAMILY RESID. SINGLE FAMILY DWELLINGS SMALL PORCHES SMALL SHEDS, ETC.	[Yellow]	"A"	2 1/2	35	15	6-12	25-50	20,000 SQ. FT.
	[Orange]	"B"	2 1/2	35	25	6-16	25-50	15,000 SQ. FT.
	[Light Orange]	"C"	2 1/2	35	25	5-24	25-50	5,000 SQ. FT.
TWO FAMILY DWELLING SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC.	[Light Green]	"D"	2 1/2	35	25	6-24	25	8,000 SQ. FT.
MULTIPLE FAMILY DWELLING SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Blue]	"E"	3	45	25	6-24 BY SETBACK	25	10,000 SQ. FT.
	[Dark Blue]	"F"	3	45	25	6-24 BY SETBACK OR 15' TO SIDE & REAR BY SETBACK	25-50 BY SETBACK	7,000 SQ. FT.
LOCAL BUSINESS SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Light Green]	"G"	3 1/2	55	25	NONE BY SETBACK	25	10,000 SQ. FT.
COMMERCIAL SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Green]	"H"	3	45	NONE BY SETBACK	14-24 BY SETBACK	NONE BY SETBACK	10,000 SQ. FT.
CENTRAL BUSINESS DIST. SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Dark Green]	"I"	4-10 BY SETBACK	NONE	NONE	NONE	NONE	7,000 SQ. FT.
LIGHT INDUSTRIAL SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Pink]	"J"	4	50	NONE BY SETBACK	NONE BY SETBACK	NONE BY SETBACK	15,000 SQ. FT.
HEAVY INDUSTRIAL SINGLE DETACHED HOUSES WITH DETACHED GARAGE, ETC. SINGLE DETACHED HOUSES DETACHED GARAGE, ETC.	[Red]	"K"	4	50	NONE BY SETBACK	NONE	14-24 BY SETBACK	15,000 SQ. FT.

quantitative maps

Quantitative Mapping

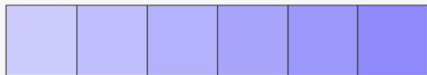
Single Hue, wide range of tints/shades



When they get photocopied



Single Hue, small range



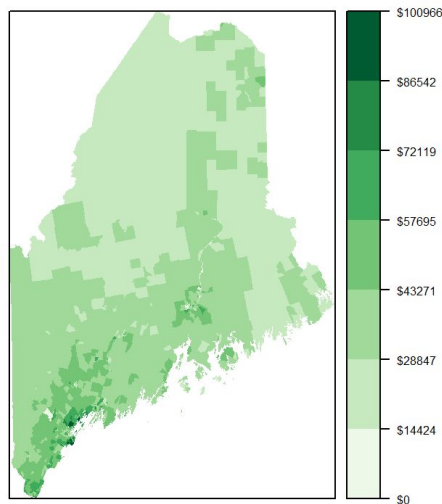
Multiple Hue Progression



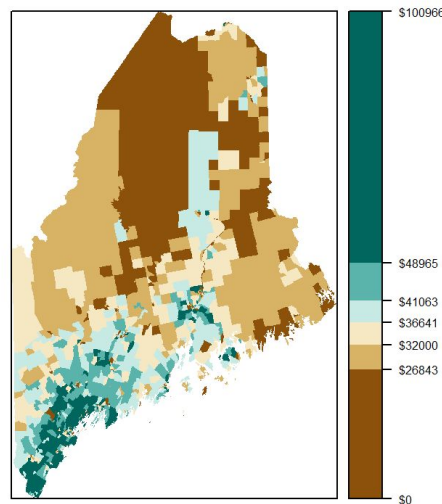
Bi-polar Color progression



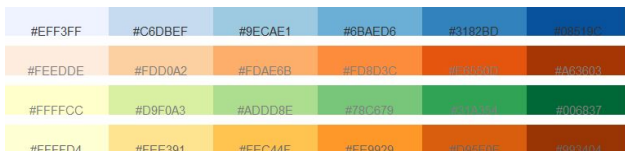
sequential choropleth map



divergent choropleth map



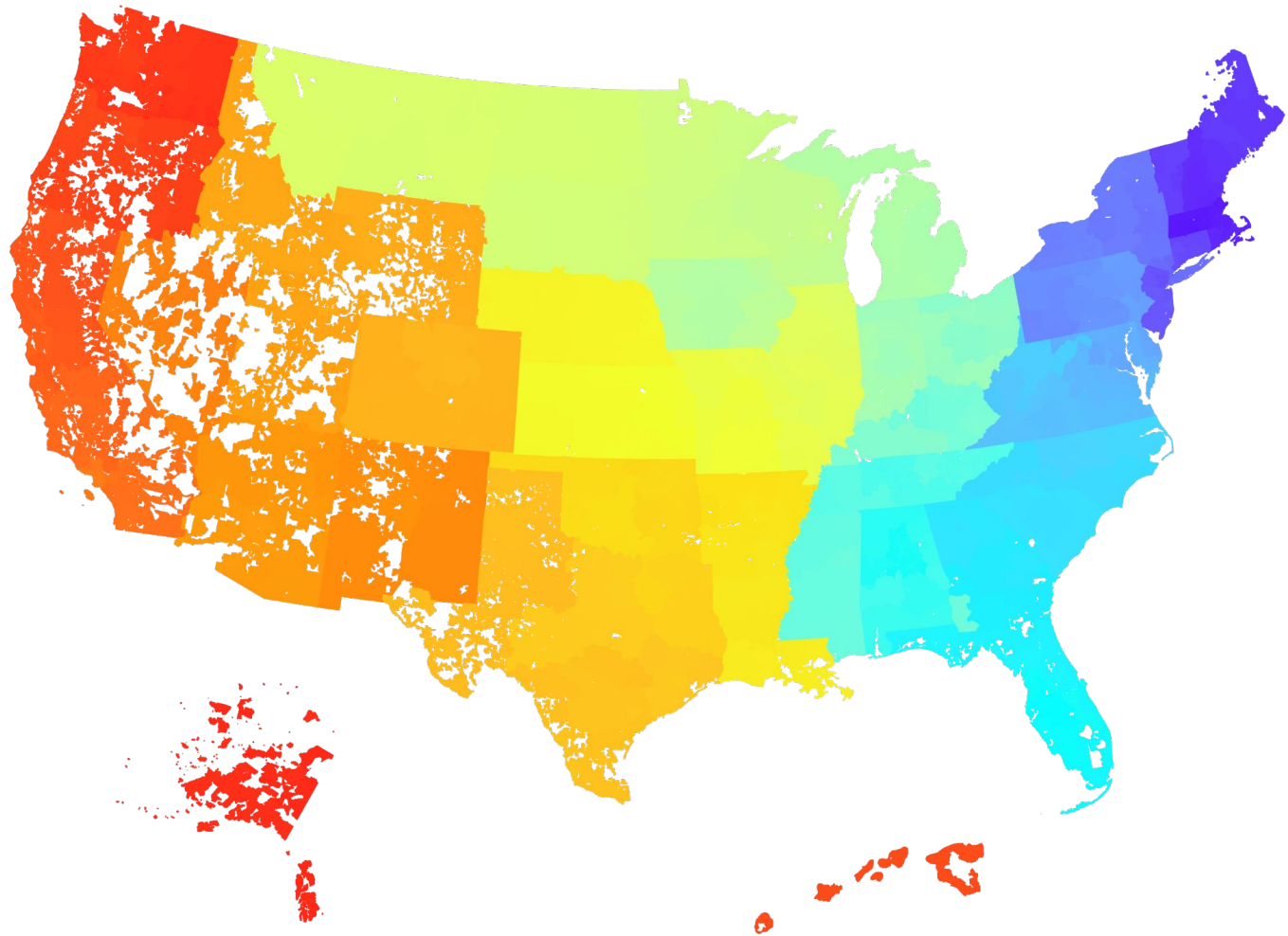
sequential color scheme



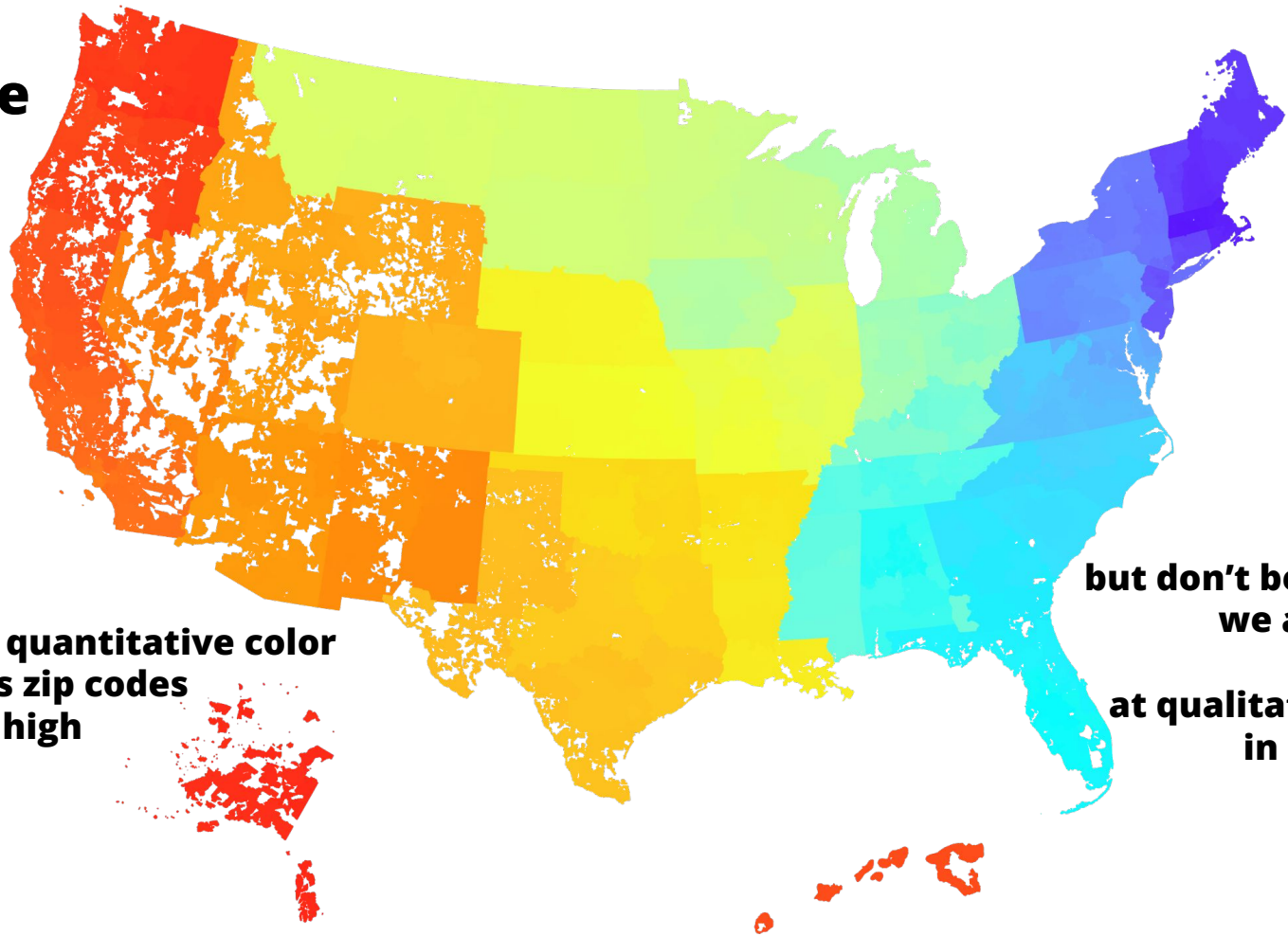
divergent color scheme



**there are edge
cases, too**



**zip codes
across the
united
states**



**continuous, quantitative color
ramp shades zip codes
from low to high**

**but don't be fooled -
we are really
looking
at qualitative data
in this map!**

Symbolic Color Connotations

Color has symbolic connotations. Such connotations subtly shape viewer reactions and should be guided by your goals for your map. Generic Western cultural color connotations include:

Blue: water, cool, positive numbers, serenity, purity, depth

Green: vegetation, lowlands, forests, youth, spring, nature, peace

Red: warm, important, negative numbers, action, anger, danger, power, warning

Yellow/tan: dry, lack of vegetation, intermediate elevation, heat

Orange: harvest, fall, abundance, fire, attention, action, warning

Brown: landforms (mountains, hills), contours, earthy, dirty, warm

Purple: dignity, royalty, sorrow, despair, richness, elegant

White: purity, clean, faith, illness, life, clarity, absence, light

Black: mystery, strength, heaviness, death, nighttime, presence

Gray: quiet, reserved, sophisticated, controlled, light, bland, dull

Cultural Color Connotations

The symbolic connotations of different colors varies from culture to culture, further complicating the use of color on maps. Check for cultural color connotations if you are mapping for a global audience.

Blue: safe cross-cultural color, because it is the color of the sky, which stands over all peoples

Green: fertility and paganism in Europe, sacred for Muslims, mourning and unhappiness in Asia

Red: Bolsheviks, communists, and other politically left organizations, purity in India

Yellow/tan: peaceful resistance movement associated with Carazon Aquino in Philippines

Orange: pro-Western activists in Ukraine, Protestants in Ireland, sacred Hindu color

Brown: mourning in India, Nazis in West, ceremonial for Australian Aboriginals

Purple: death and crucifixion in Europe, mysticism, prostitution in the Middle East

White: unhappiness in India, mourning in China, royalists and traditionalists in Western

Black: fascists, anarchists, and other extremists in Western world, death, mourning in West

Gray: corporate culture in the West (also blue), dead and dull in Feng Shui

symbolization

Difference

All symbols work by being different from other symbols. But some symbols can be developed from others by using a process of visual differentiation.



Interstate Highway



State Highway



County Highway



Other Road



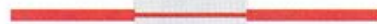
Under Construction



Under Construction



Under Construction



Through Road in
Populated Place

Resemblance

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.



Relationship

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.

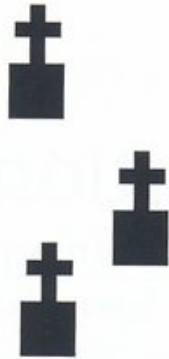


A map showing restaurants, antique stores, and museums in a town uses different shapes; shapes vary in kind, as do the data.

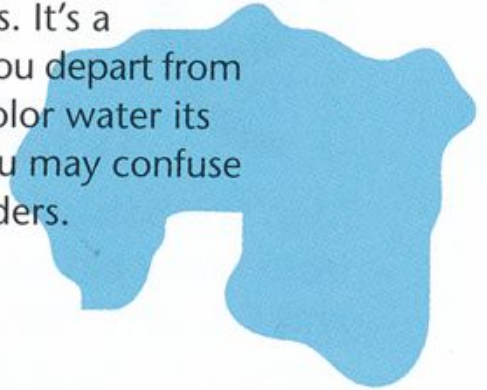


Convention

Of course, all map symbols are symbols by convention. But this is particularly clear when symbols reveal cultural bias or don't resemble what they symbolize. The U.S. Geological Survey uses a Christian cross to symbolize all places of worship – church, mosque, synagogue. Fail!



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.



symbol libraries

NPS Map Symbols: Updated August, 2022

Accessibility



Camping and Picnicking



Clean Environment



Communications and Technology



Health and Safety



Information and Interpretation



Nature and Wildlife



Park Buildings



Park Sites



Permits and Regulations



Recreation (Land)



Recreation (Water)



Recreation (Winter)



Services



Transportation



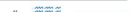
Miscellaneous





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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What would feminist data visi

visionscarto.net/feminist-data-visualization

visionscarto

What would feminist data visualization look like?

#methodology #visualization #cartography #critic #situated knowledge #feminism #gender

23 JANUARY 2017

by *Catherine D'Ignazio*

Assistant Prof of Data Visualization & Civic Media, Journalism Dept, Emerson College, Boston (USA) ; kanarinka.com

While there is a lot of hype about data visualization, and a lot of new tools for doing it (my colleague [Rahul Bhargava](#) and I have counted over 500!), fewer people are thinking critically about the politics and ethics of representation. This, combined with a chart-scared general public, means that data visualizations wield a tremendous amount of rhetorical power. Even when we rationally know that data visualizations do not represent “the whole world”, we forget that fact and accept charts as facts because they are generalized,

The Seven Principles of Data Feminism

Catherine d'Ignazio and Lauren Klein

The seven principles of data feminism are as follows:

- **Examine power.** Data feminism begins by analysing how power operates in the world.
- **Challenge power.** Data feminism commits to challenging unequal power structures and working toward justice.
- **Elevate emotion and embodiment.** Data feminism teaches us to value multiple forms of knowledge, including the knowledge that comes from people as living, feeling bodies in the world.
- **Rethink binaries and hierarchies.** Data feminism requires us to challenge the gender binary, along with other systems of counting and classification that perpetuate oppression.
- **Embrace pluralism.** Data feminism insists that the most complete knowledge comes from synthesising multiple perspectives, with priority given to local, Indigenous, and experiential ways of knowing.
- **Consider context.** Data feminism asserts that data is not neutral or objective. It is the product of unequal social relations, and this context is essential for conducting accurate, ethical analysis.
- **Make labour visible.** The work of data science, like all work in the world, is the work of many hands. Data feminism makes this labour visible so that it can be recognised and valued.

**some good (free) general
resources for map design**

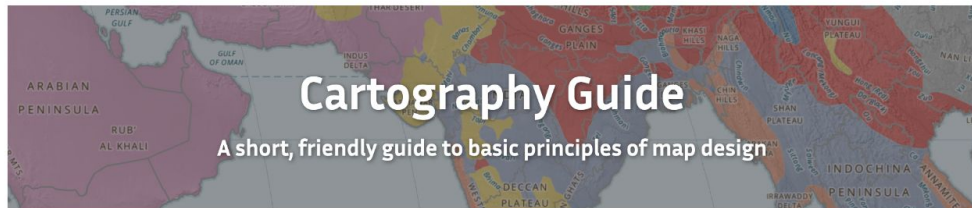


Axis Maps

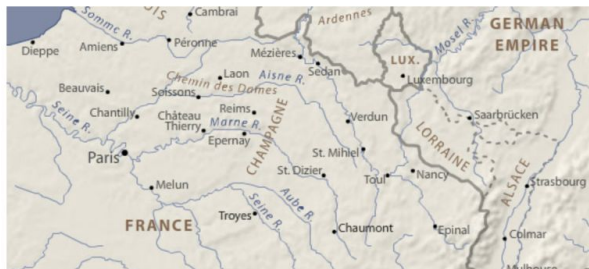
[Projects](#)

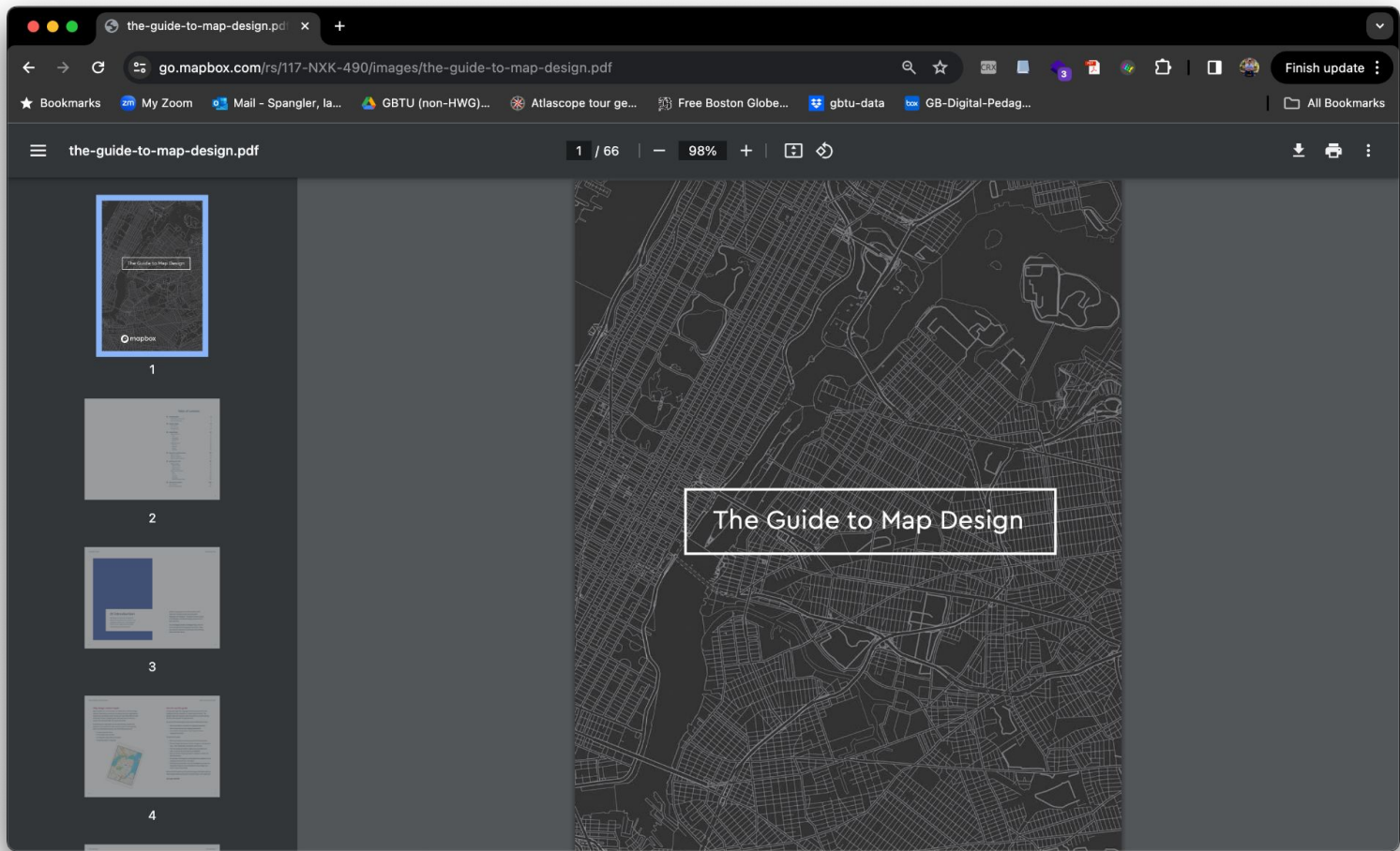
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Labeling and text hierarchy in cartography





CV-07 - Visual Hierarchy and

gistbok.ucgis.org/bok-topics/visual-hierarchy-and-layout

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CV-07 - Visual Hierarchy and Layout

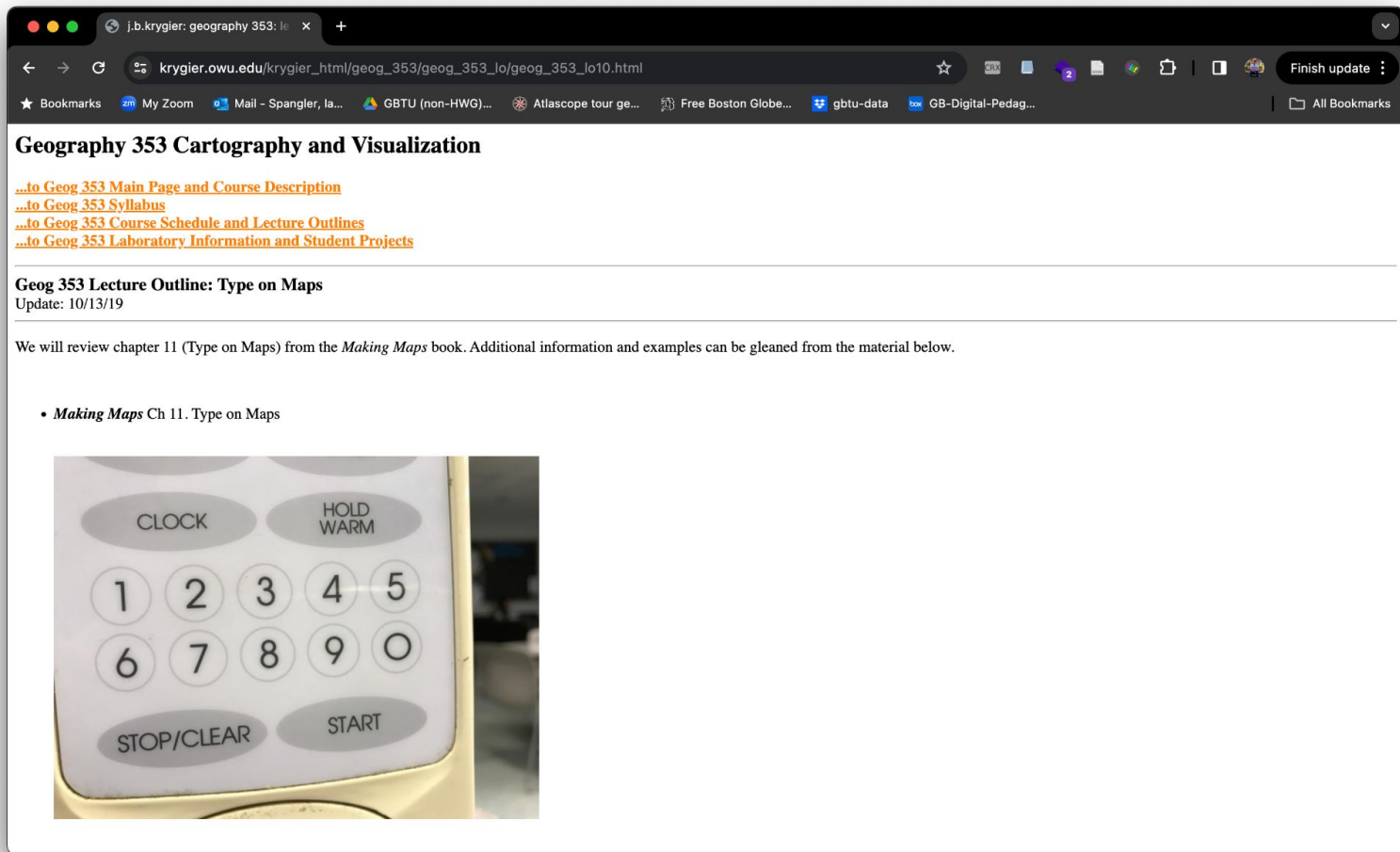
Mapmaking, by digital or manual methods, involves taking complex geographic information and building a visual image with many components. Creating effective maps requires an understanding of how to construct the elements of the map into a coherent whole that executes the communicative purpose of the map. Visual hierarchy and layout are the cartographer's tools for organizing the map and completing the map construction. The cartographer layers the mapped geography in an image into a visual hierarchy emphasizing some features and de-emphasizing others in vertical ordering of information. Likewise, the cartographer arranges the components of a map image—title, main map, inset map, north arrow, scale, legend, toolbar, etc.—into a layout that guides the reader's eye around the horizontal plane of the map. The visual hierarchy and layout processes work together to create the structure of the map image.

Author and Citation Info:

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gallery

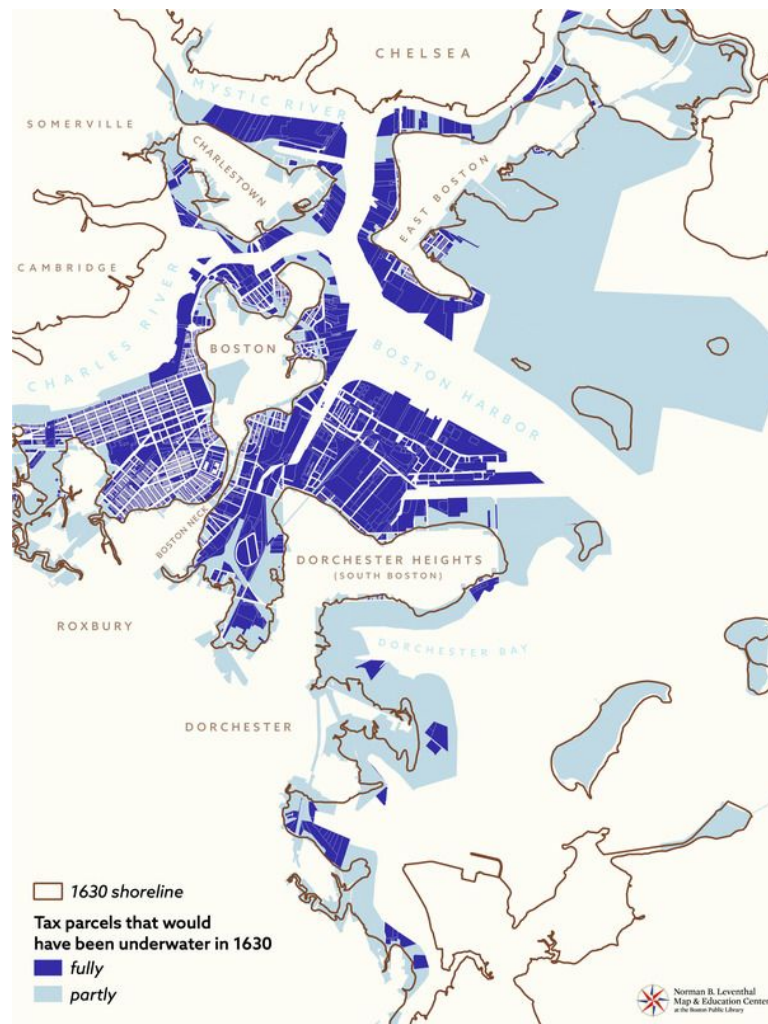
**how are these maps following
or disobeying “best
principles” in order to convey
meaning?**

consider why these maps look good

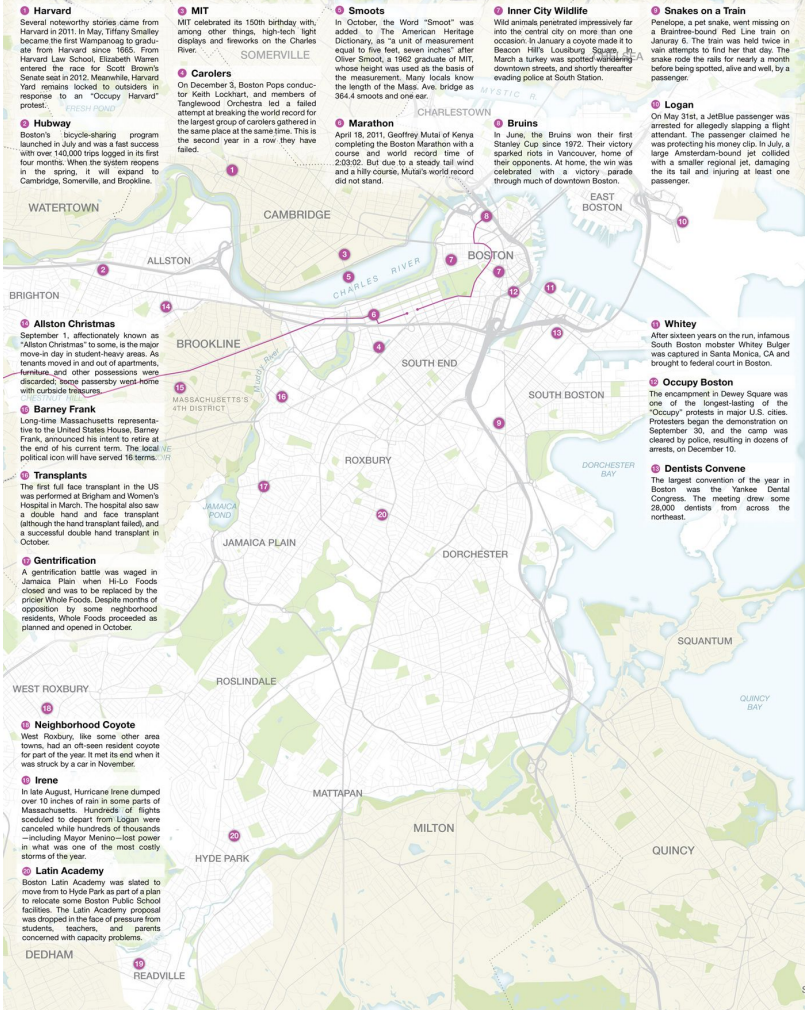
or, well - *whether* they look good

**and whether they communicate
their argument well**

**and whether it's easy to grasp what
the argument is**







Actual European Discoveries

land unknown by humans* before the Age of Exploration



NOTES

Large Dark Names = currently inhabited
Small Light Names = currently uninhabited
(or only military / scientific personnel)

Stripes indicate ambiguous or shared discovery.

* Islands marked with an asterisk show evidence of prior human habitation but were unoccupied at the time of European discovery. (The north coast of Greenland was also previously occupied. The South Shetland Islands may have been as well.)

† Islands in the Indian Ocean marked with a dagger were known to Arab traders but never occupied.

All islands labeled with present-day names, which are often different from the names given at discovery. Equal-area projection (Eckert IV). Map by Bill Rankin, 2013; www.radicalcartography.net

country sponsoring original exploration	date of first discovery	total area discovered (non-continental; km ²)	current population of discovered land
Portugal	1418	13,776	3,424,609
Spain	1493	8,938	149,732
Netherlands	1596	73,903	5,642
United Kingdom	1609	10,597	11,436
France	1711	7,627	70
Russia	1712	74,634	613
United States	1796	7,699	3,754
Austria-Hungary	1873	16,134	0
Norway	1878	34	0
		213,342	3,595,856
		(roughly the area of Great Britain; 0.14% of all land)	(0.05% of all humans)
		(adding continental land at the poles, ~1% of all land)	

AMERICAN SLAVE INSURANCE

THIS MAP SHOWS 676 KNOWN POLICIES FROM BEFORE THE CIVIL WAR

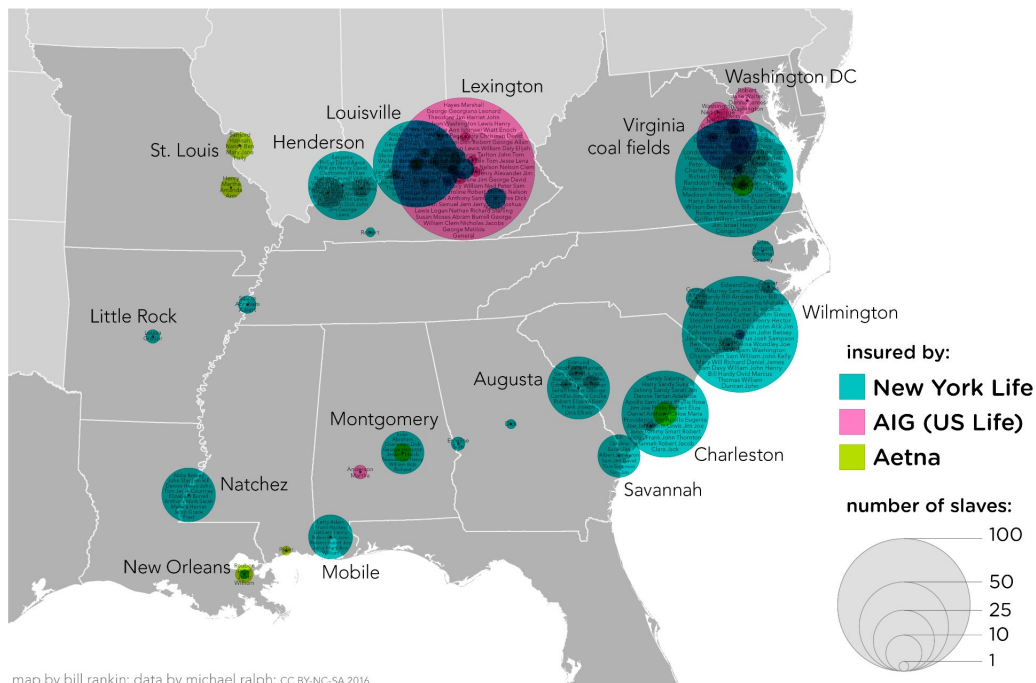
Slave insurance and life insurance were developed at the same time, often by the same companies.

Insured slaves were usually highly skilled and rented to others, especially in cities.

They worked on Ohio River steamboats, in Virginia coal fields, in skilled trades on the Atlantic coast.

Most were men, but many were women (nurses, domestics, seamstresses).

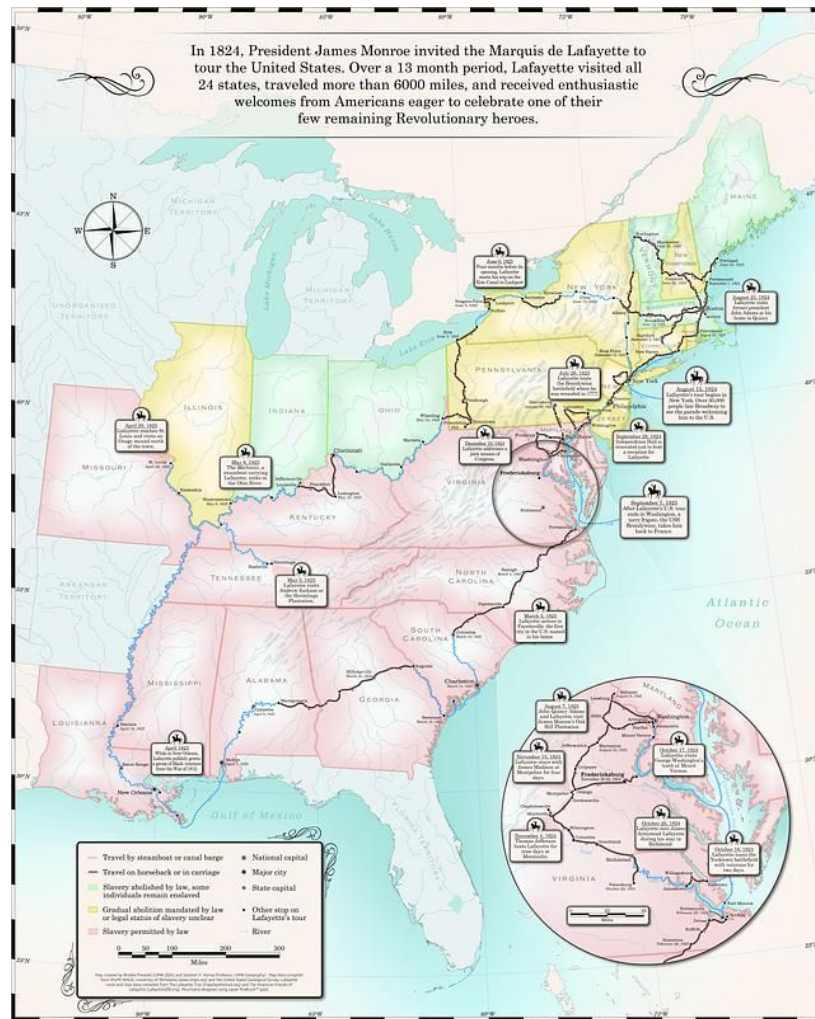
WE KNOW THEIR NAMES (zoom in)



CURRENT RESERVATIONS AND TRIBAL LANDS



In 1824, President James Monroe invited the Marquis de Lafayette to tour the United States. Over a 13 month period, Lafayette visited all 24 states, traveled more than 6000 miles, and received enthusiastic welcomes from Americans eager to celebrate one of their few remaining Revolutionary heroes.

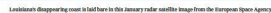


Meghan Kelly

Meghan Kelly







HURRICANES SINCE 1851

Classified for the Earth-Ocean Hurricane Index (EOHI) based on the NOAA dataset for Performance 1.0.

