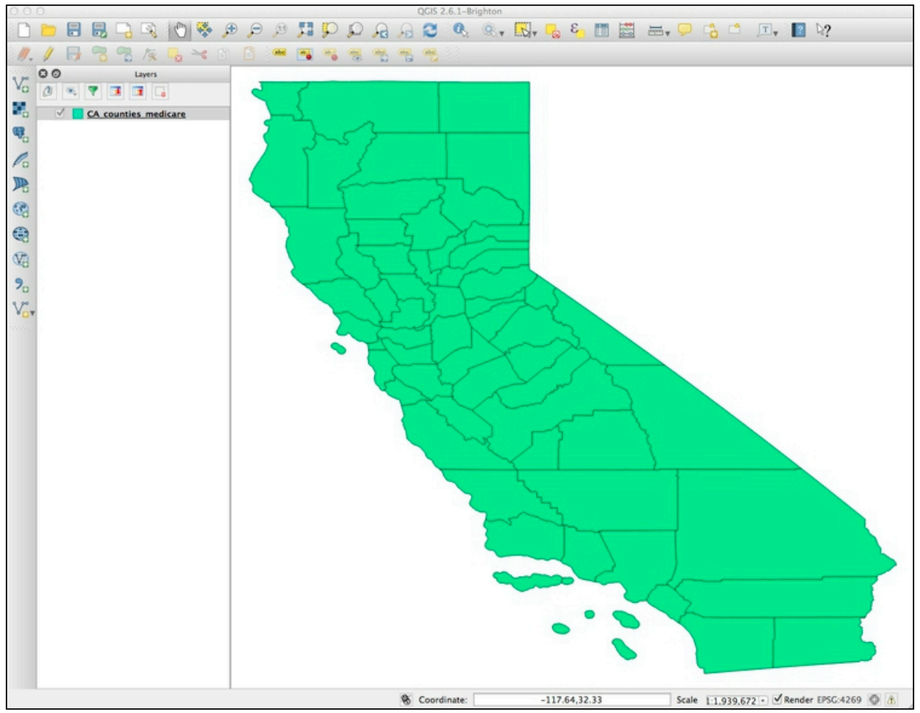
Maps in D3.js

Shapefiles

Shapefiles are geographic (GIS) vector files.
(Like SVGs, but for maps)



Shapefiles

Shapefiles tend to come as folders (or .zip)

.shp – Shapefile itself, vector information.

.dbf – Database of attributes for each feature.

.prj – Projection file, describing which projection is being used.

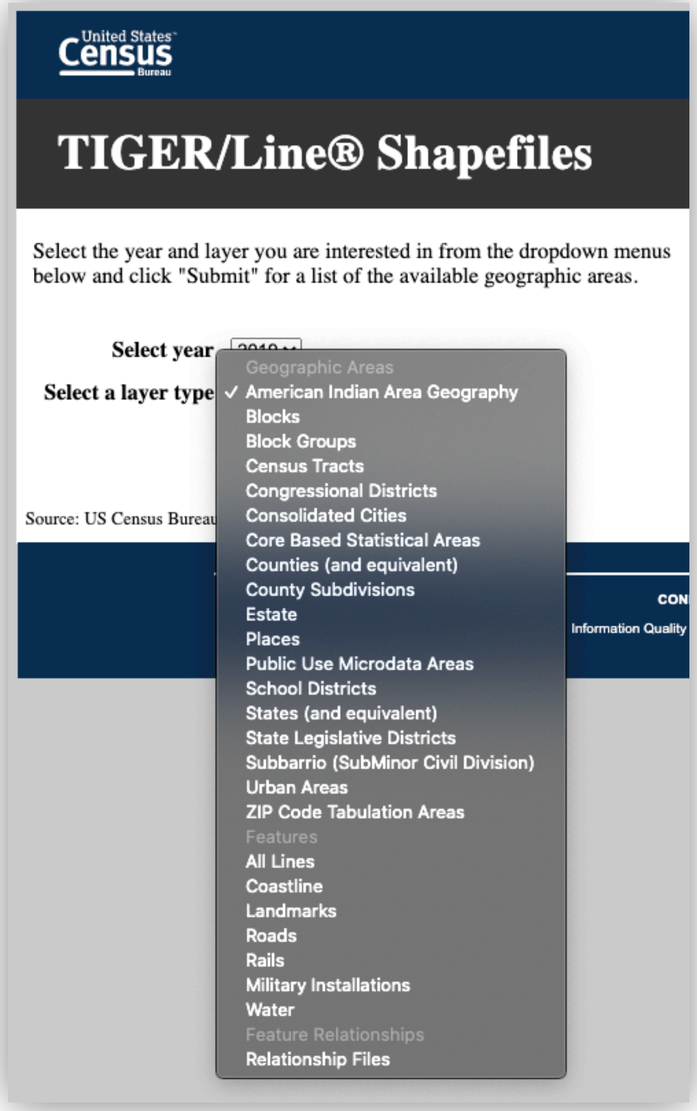
Where do I get shapefiles?

U.S. Census Bureau

City/County/State Governments

Make your own (using QGIS)

Github



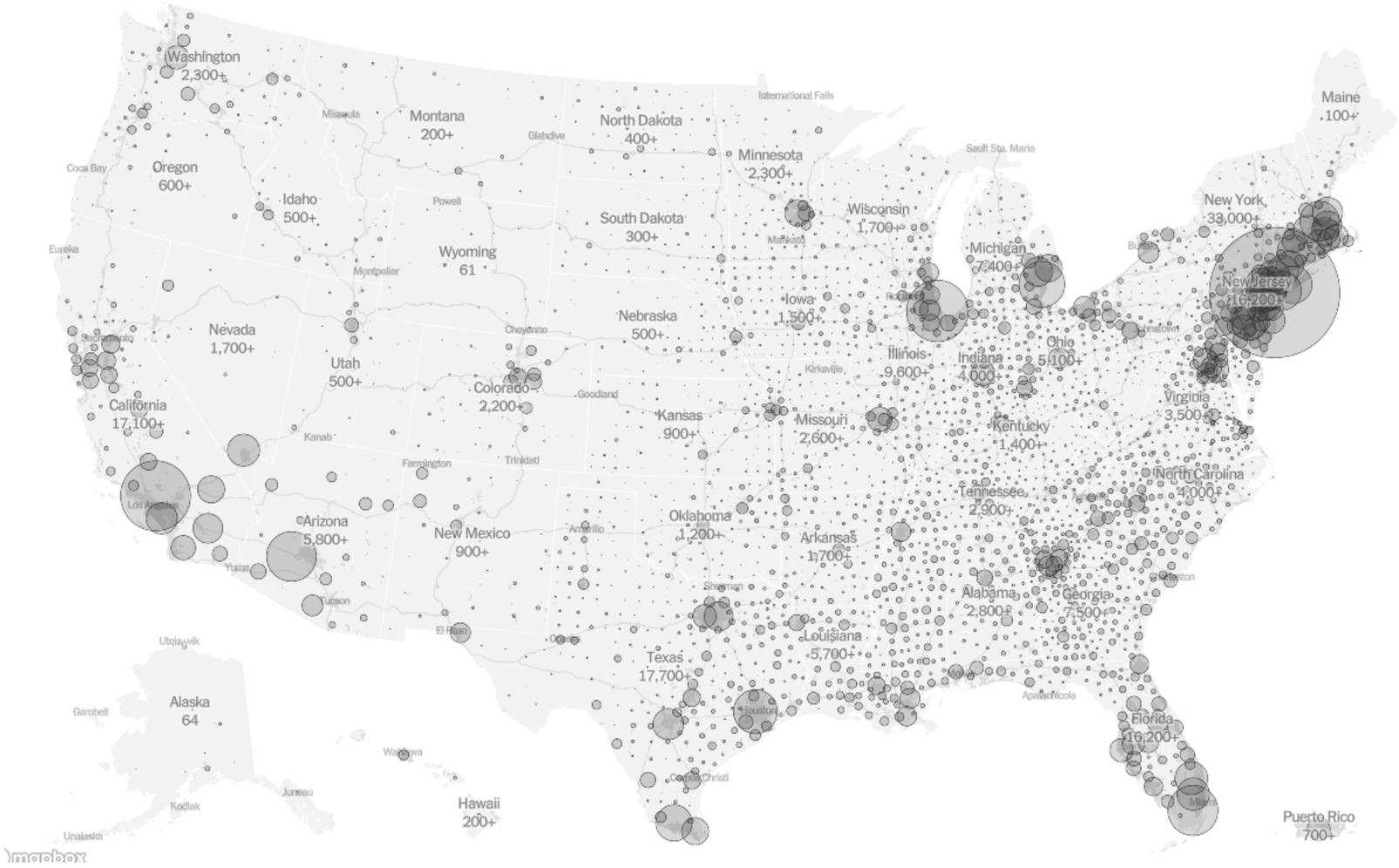
Features

"Features" are vector shapes in your map.

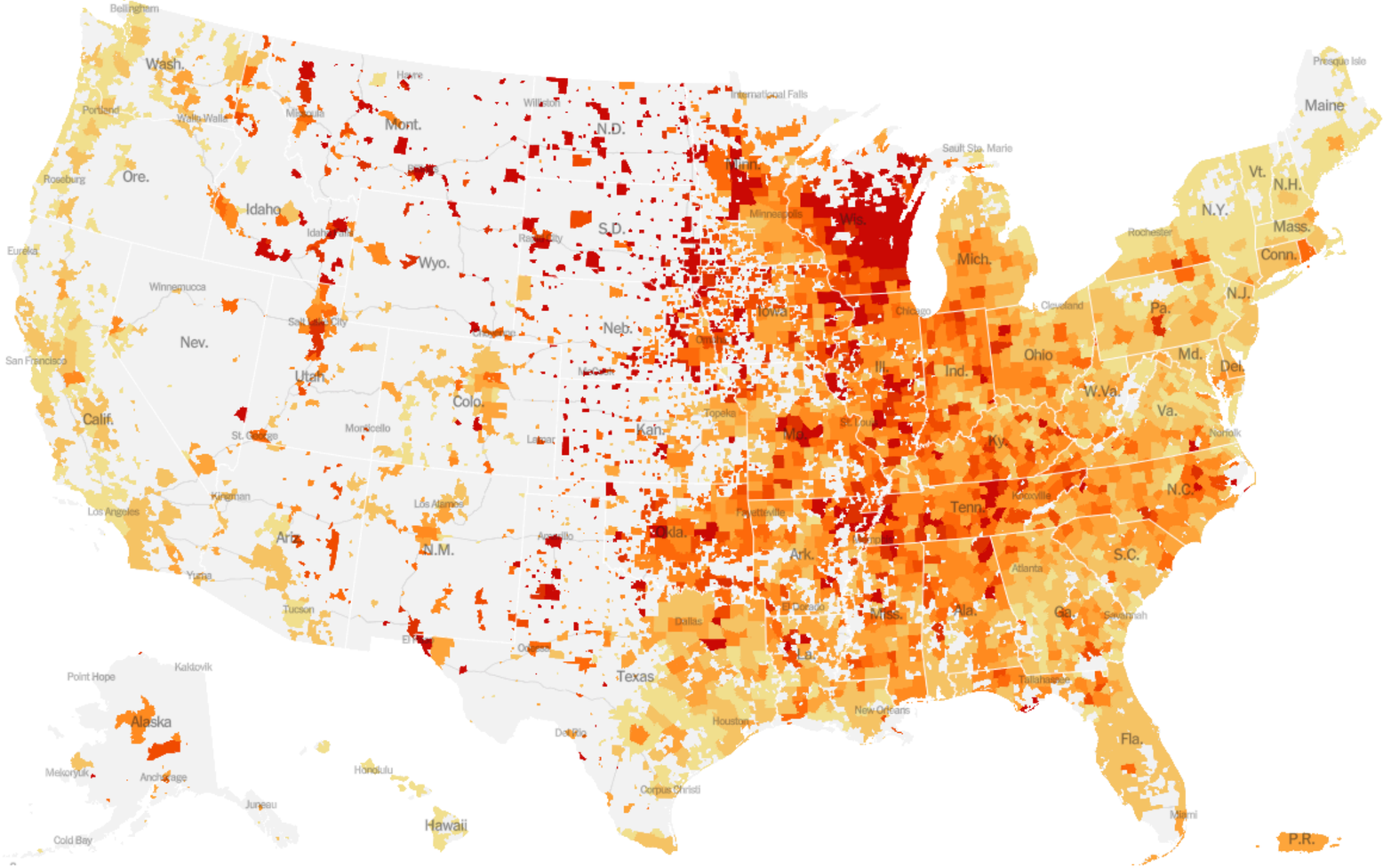
Some examples are:

- states - - - - - (polygons/paths)
- counties - - - - - (polygons/paths)
- roads - - - - - (lines)
- locations - - - - - (points)

Points (specific locations)



Polygons (areas)



Lines (roads, outlines)

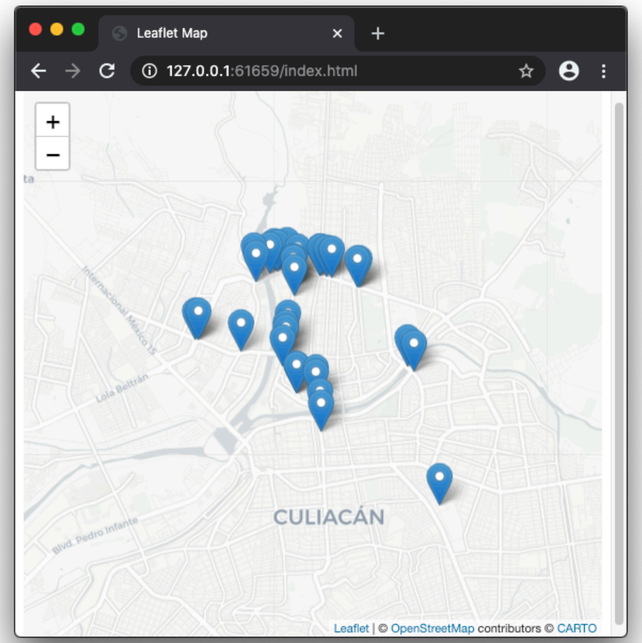
Your data needs location column(s)

Your data needs location column(s)

Latitude and Longitude are x,y coordinates for the earth. With these two numbers you can identify any location on earth to a particular degree of accuracy.

For a point map with markers, you will need latitude and longitude data for each point.

E	F	G	H	I
Latitude	Longitude	County Seat	Population(2	Land Areakr
+37.648081°	–121.913304°	Oakland	1,510,271	1,914.05
+38.617610°	–119.798999°	Markleeville	1,175	1,912.27
+38.443550°	–120.653856°	Jackson	38,091	1,539.96
+39.665959°	–121.601919°	Oroville	220,000	4,238.42
+38.187844°	–120.555115°	San Andreas	45,578	2,641.82
+39.177739°	–122.237563°	Colusa	21,419	2,980.38
+37.919479°	–121.951543°	Martinez	1,049,025	1,854.27
+41.749903°	–123.980998°	Crescent City	28,610	2,606.49
+38.785532°	–120.534398°	Placerville	181,058	4,423.40
+36.761006°	–119.655019°	Fresno	930,450	15,431.13
+39.602546°	–122.401700°	Willows	28,122	3,403.11
+40.706673°	–123.925818°	Eureka	134,623	9,241.05
+33.040816°	–115.355395°	El Centro	174,528	10,817.35
+36.561977°	–117.403927°	Independence	18,546	26,368.35
+35.346629°	–118.729506°	Bakersfield	839,631	21,061.57
+36.072478°	–119.815530°	Hanford	152,982	3,598.58
+39.094802°	–122.746757°	Lakeport	64,665	3,254.23
+40.721089°	–120.629931°	Susanville	34,895	11,761.61
+34.196398°	–118.261862°	Los Angeles	9,818,605	10,509.87
+37.210039°	–119.749852°	Madera	150,865	5,534.98
+38.051817°	–122.745974°	San Rafael	252,409	1,347.59
+37.570034°	–119.912860°	Mariposa	18,251	3,752.42
+39.432388°	–123.442881°	Ukiah	87,841	9,081.39
+37.194806°	–120.722802°	Merced	255,793	5,011.56



Geocoding Addresses

We can’t map postal addresses directly. These aren’t geographic coordinates. We need to convert them to latitude and longitudes.

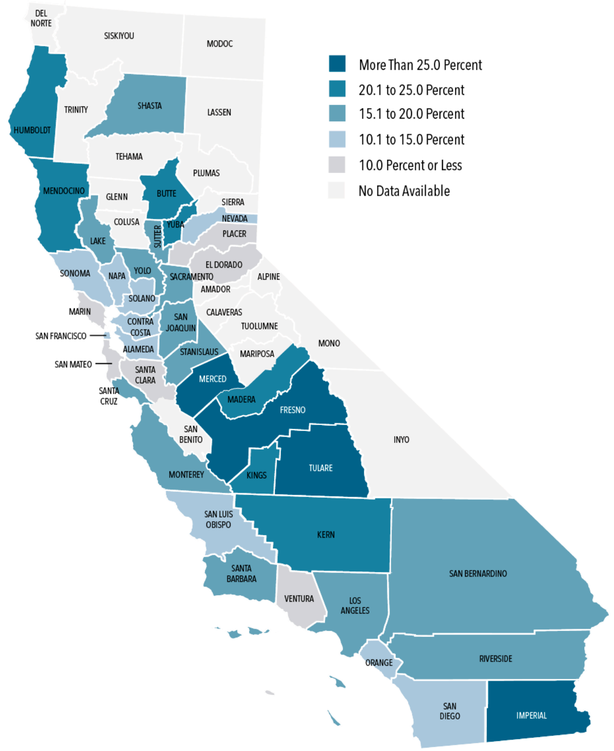
121 North Gate Hall
Berkeley, CA 94720

37.874866, -122.259645

Location Data for Shapes

Your data needs to match some attribute in your shapefile.

B	C	D	E	F	G
State	FIPS	County [2]	Population(2	Land Areakr	Land Aream
CA	6001	Alameda	1,510,271	1,914.05	739.017
CA	6003	Alpine	1,175	1,912.27	738.332
CA	6005	Amador	38,091	1,539.96	594.583
CA	6007	Butte	220,000	4,238.42	1,636.46
CA	6009	Calaveras	45,578	2,641.82	1,020.01
CA	6011	Colusa	21,419	2,980.38	1,150.73
CA	6013	Contra Costa	1,049,025	1,854.27	715.937
CA	6015	Del Norte	28,610	2,606.49	1,006.37
CA	6017	El Dorado	181,058	4,423.40	1,707.88
CA	6019	Fresno	930,450	15,431.13	5,957.99
CA	6021	Glenn	28,122	3,403.11	1,313.95
CA	6023	Humboldt	134,623	9,241.05	3,567.99
CA	6025	Imperial	174,528	10,817.35	4,176.60
CA	6027	Inyo	18,546	26,368.35	10,180.88
CA	6029	Kern	839,631	21,061.57	8,131.92
CA	6031	Kings	152,982	3,598.58	1,389.42
CA	6033	Lake	64,665	3,254.23	1,256.46
CA	6035	Lassen	34,895	11,761.61	4,541.18
CA	6037	Los Angeles	9,818,605	10,509.87	4,057.88
CA	6039	Madera	150,865	5,534.98	2,137.07
CA	6041	Marin	252,409	1,347.59	520.306
CA	6043	Mariposa	18,251	3,752.42	1,448.82
CA	6045	Mendocino	87,841	9,081.39	3,506.34



FIPS codes

Federal Information Processing Standard

state-level

01	ALABAMA
02	ALASKA
04	ARIZONA
05	ARKANSAS
06	CALIFORNIA
08	COLORADO
09	CONNECTICUT
10	DELAWARE
11	DISTRICT OF COLUMBIA
12	FLORIDA
13	GEORGIA
15	HAWAII
16	IDAHO

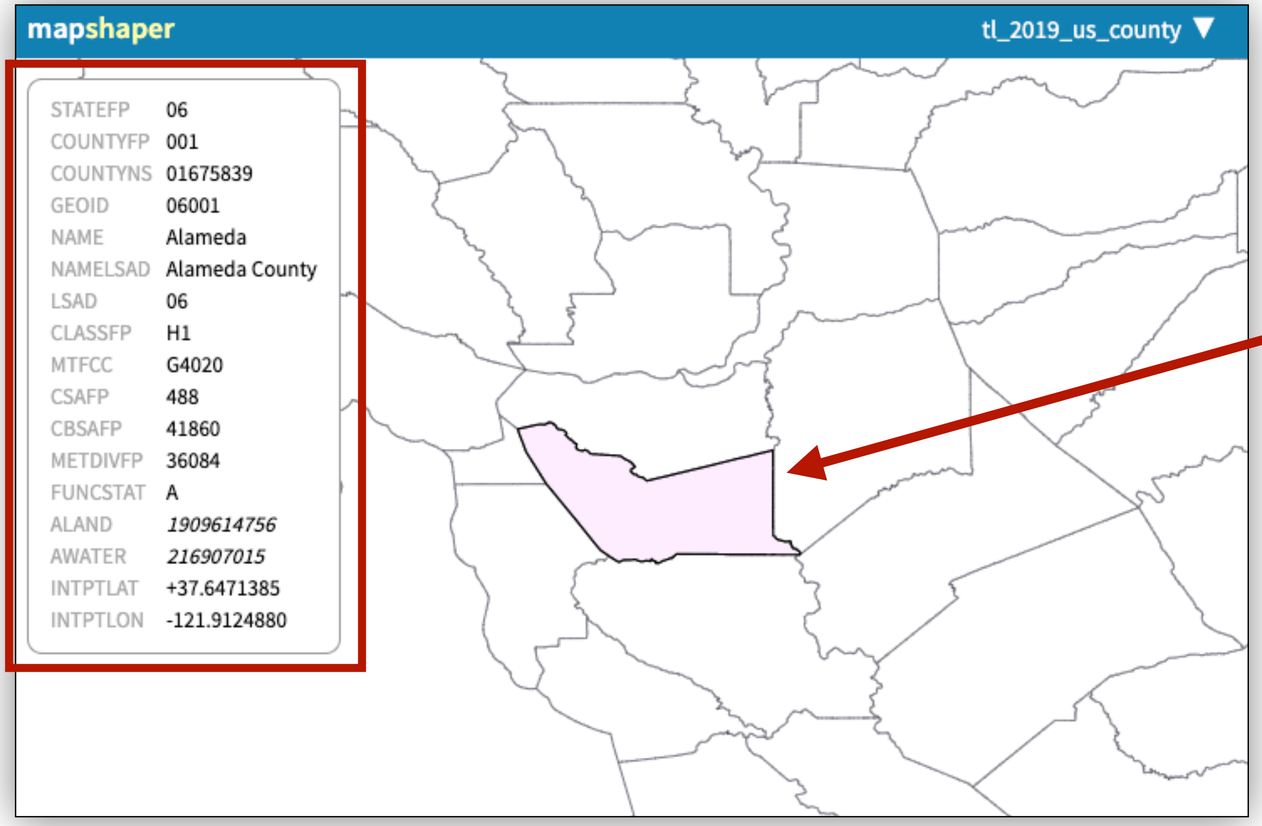
county-level

06001	Alameda County
06003	Alpine County
06005	Amador County
06007	Butte County
06009	Calaveras County
06011	Colusa County
06013	Contra Costa County
06015	Del Norte County
06017	El Dorado County
06019	Fresno County
06021	Glenn County
06023	Humboldt County
06025	Imperial County

0606001 - Alameda County
06001 - Alameda County
6001 - Alameda County

Inspect your shapefile first

Data associated with this shape

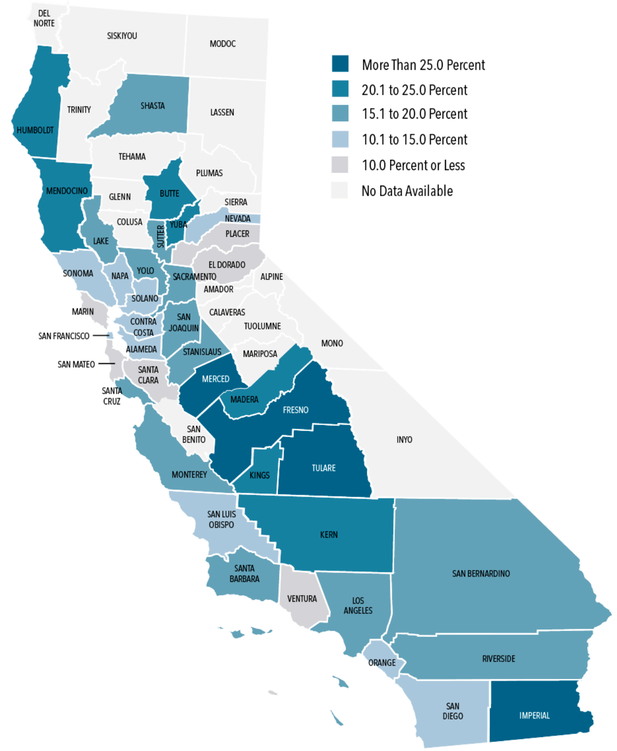


Alameda County

Matching FIPs codes

FIPS codes will specify which county

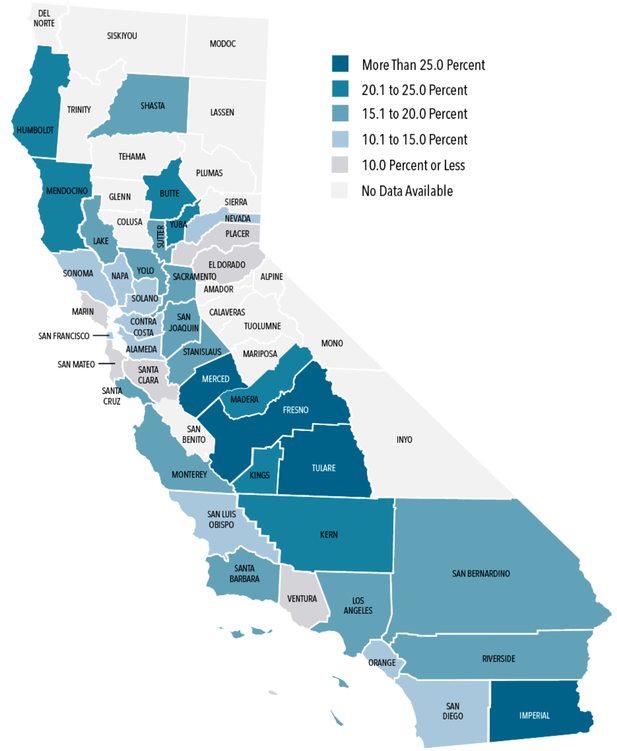
B	C	D	E	F	G
State	FIPS	County [2]	Population(2	Land Areakr	Land Aream
CA	6001	Alameda	1,510,271	1,914.05	739.017
CA	6003	Alpine	1,175	1,912.27	738.332
CA	6005	Amador	38,091	1,539.96	594.583
CA	6007	Butte	220,000	4,238.42	1,636.46
CA	6009	Calaveras	45,578	2,641.82	1,020.01
CA	6011	Colusa	21,419	2,980.38	1,150.73
CA	6013	Contra Costa	1,049,025	1,854.27	715.937
CA	6015	Del Norte	28,610	2,606.49	1,006.37
CA	6017	El Dorado	181,058	4,423.40	1,707.88
CA	6019	Fresno	930,450	15,431.13	5,957.99
CA	6021	Glenn	28,122	3,403.11	1,313.95
CA	6023	Humboldt	134,623	9,241.05	3,567.99
CA	6025	Imperial	174,528	10,817.35	4,176.60
CA	6027	Inyo	18,546	26,368.35	10,180.88
CA	6029	Kern	839,631	21,061.57	8,131.92
CA	6031	Kings	152,982	3,598.58	1,389.42
CA	6033	Lake	64,665	3,254.23	1,256.46
CA	6035	Lassen	34,895	11,761.61	4,541.18
CA	6037	Los Angeles	9,818,605	10,509.87	4,057.88
CA	6039	Madera	150,865	5,534.98	2,137.07
CA	6041	Marin	252,409	1,347.59	520.306
CA	6043	Mariposa	18,251	3,752.42	1,448.82
CA	6045	Mendocino	87,841	9,081.39	3,506.34



Matching FIPs codes

Another column will specify the shade of the choropleth

B	C	D	E	F	G
State	FIPS	County [2]	Population(2	Land Areakr	and Aream
CA	6001	Alameda	1,510,27	1,914.05	739.017
CA	6003	Alpine	1,17	1,912.27	738.332
CA	6005	Amador	38,09	1,539.96	594.583
CA	6007	Butte	220,00	4,238.42	1,636.46
CA	6009	Calaveras	45,57	2,641.82	1,020.01
CA	6011	Colusa	21,41	2,980.38	1,150.73
CA	6013	Contra Costa	1,049,02	1,854.27	715.937
CA	6015	Del Norte	28,61	2,606.49	1,006.37
CA	6017	El Dorado	181,05	4,423.40	1,707.88
CA	6019	Fresno	930,45	15,431.13	5,957.99
CA	6021	Glenn	28,12	3,403.11	1,313.95
CA	6023	Humboldt	134,62	9,241.05	3,567.99
CA	6025	Imperial	174,52	10,817.35	4,176.60
CA	6027	Inyo	18,54	26,368.35	10,180.88
CA	6029	Kern	839,63	21,061.57	8,131.92
CA	6031	Kings	152,98	3,598.58	1,389.42
CA	6033	Lake	64,66	3,254.23	1,256.46
CA	6035	Lassen	34,89	11,761.61	4,541.18
CA	6037	Los Angeles	9,818,60	10,509.87	4,057.88
CA	6039	Madera	150,86	5,534.98	2,137.07
CA	6041	Marin	252,40	1,347.59	520.306
CA	6043	Mariposa	18,25	3,752.42	1,448.82
CA	6045	Mendocino	87,84	9,081.39	3,506.34



Other mapping file types

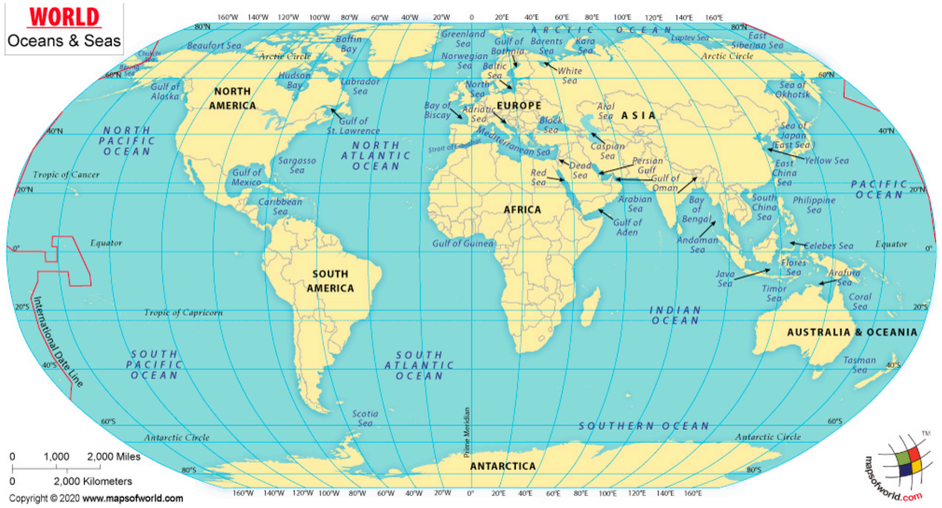
These are files you would use to display map data on the web.
You would convert shape files to one of these formats.

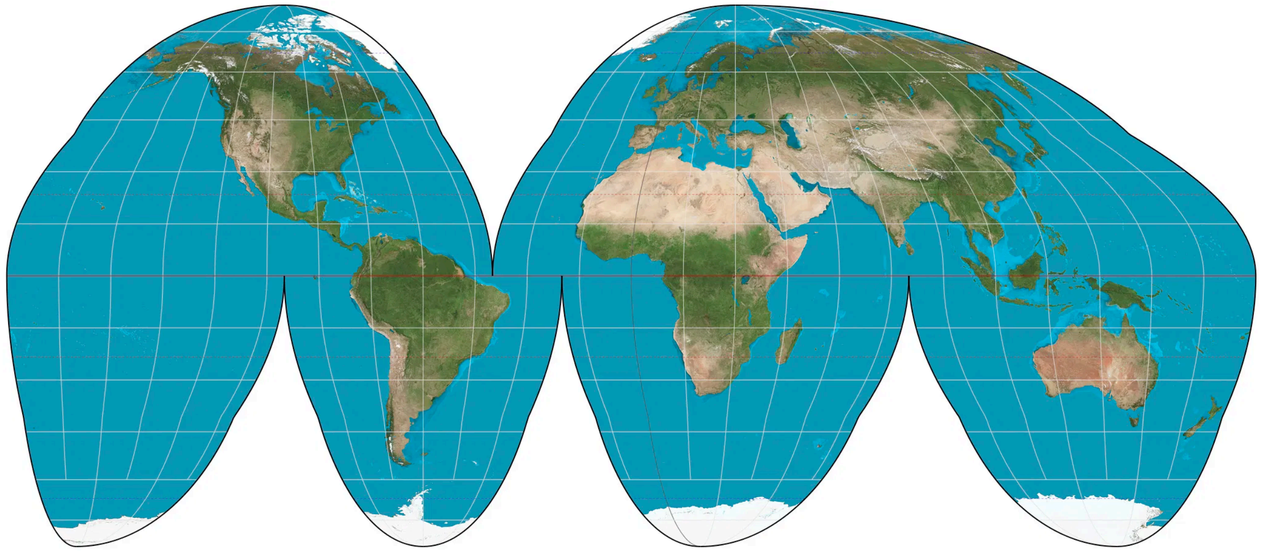
.geojson – A JSON file with a specific format that is meant to show geographic features (shapes).

.topojson – Same as above, but optimized to be faster and smaller. Uses arc data instead of connecting the dots.

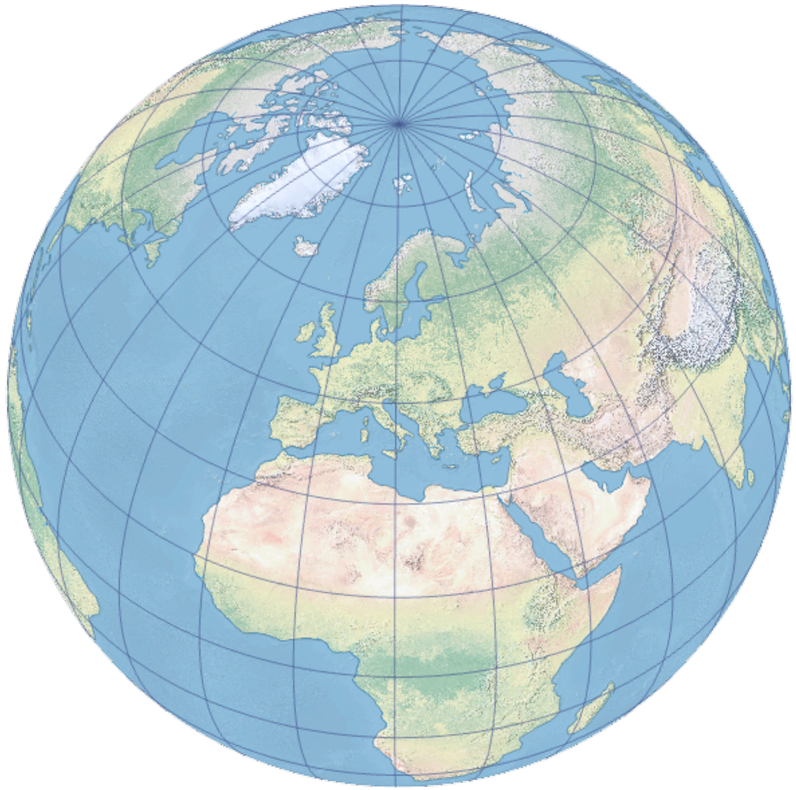
.kml .kmz – Google-specific files. They are XML (markup language) files that also have geographic data.

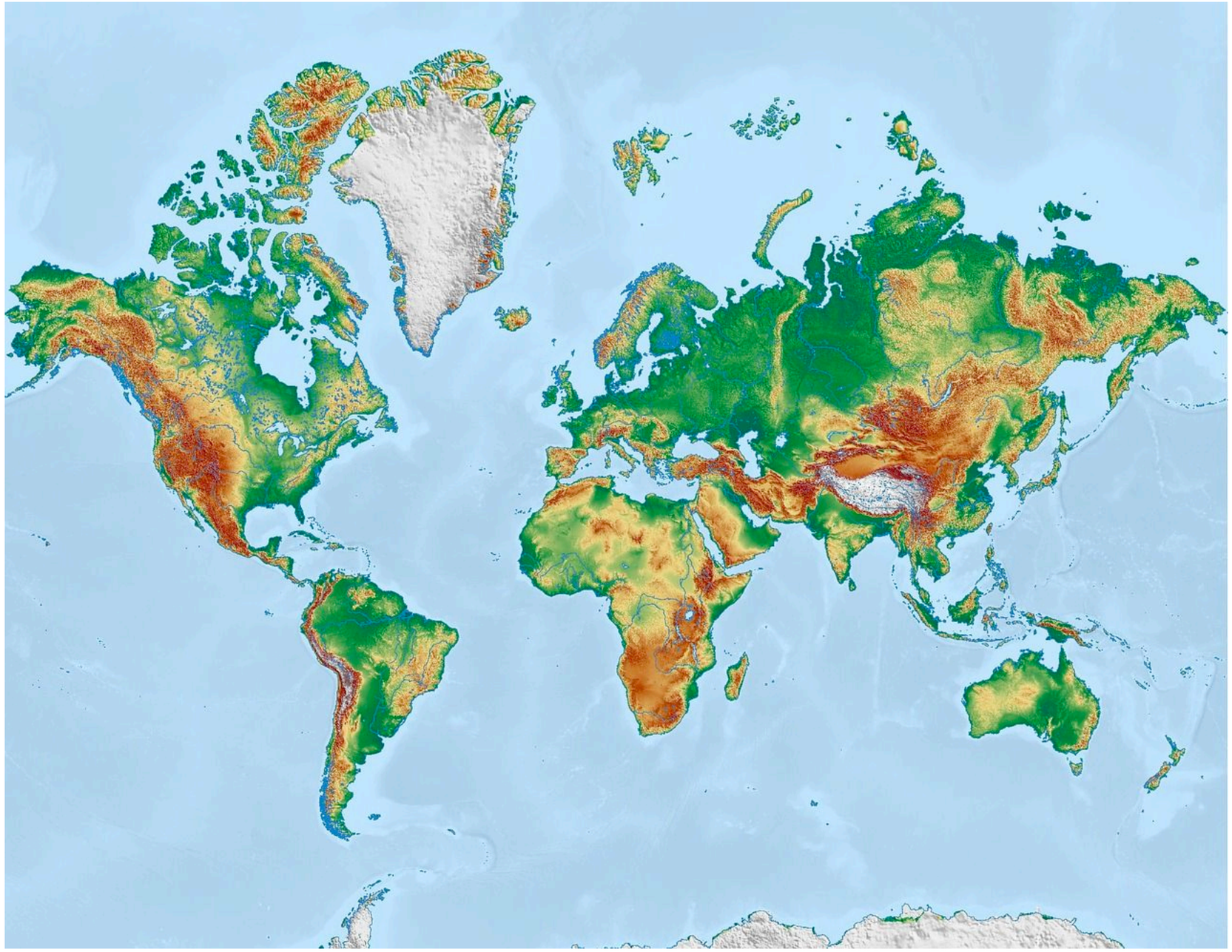
Map Projections

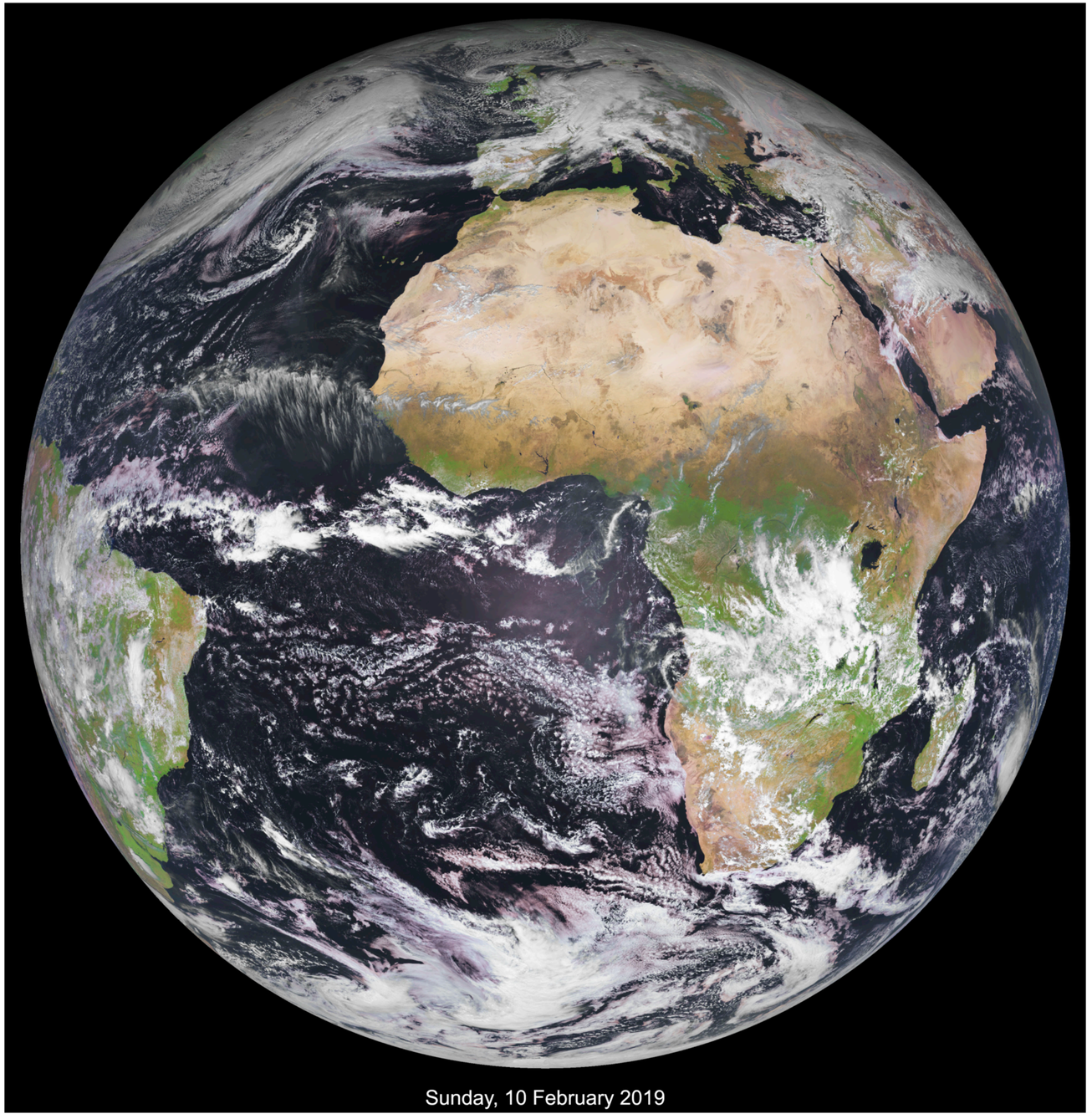


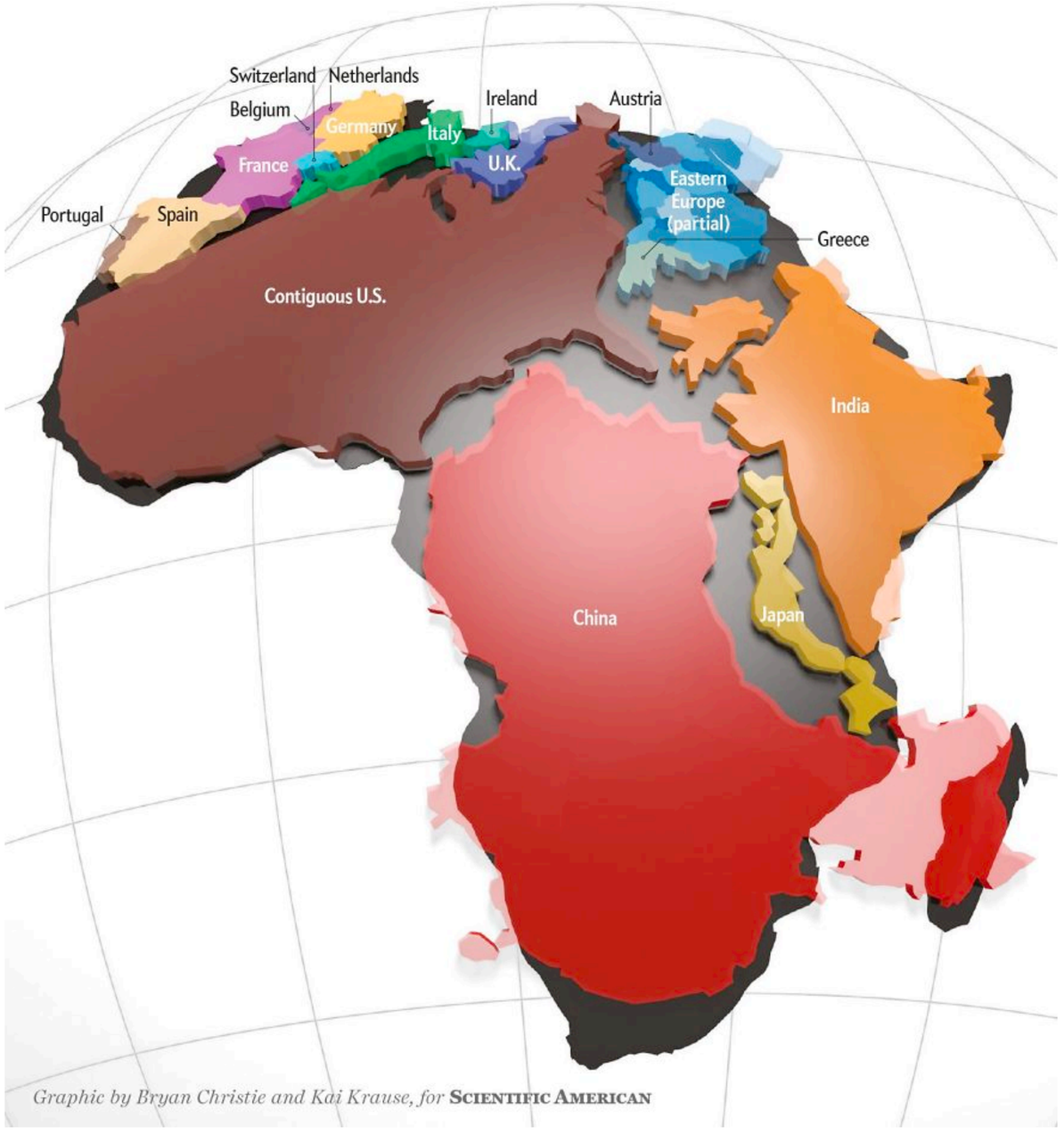


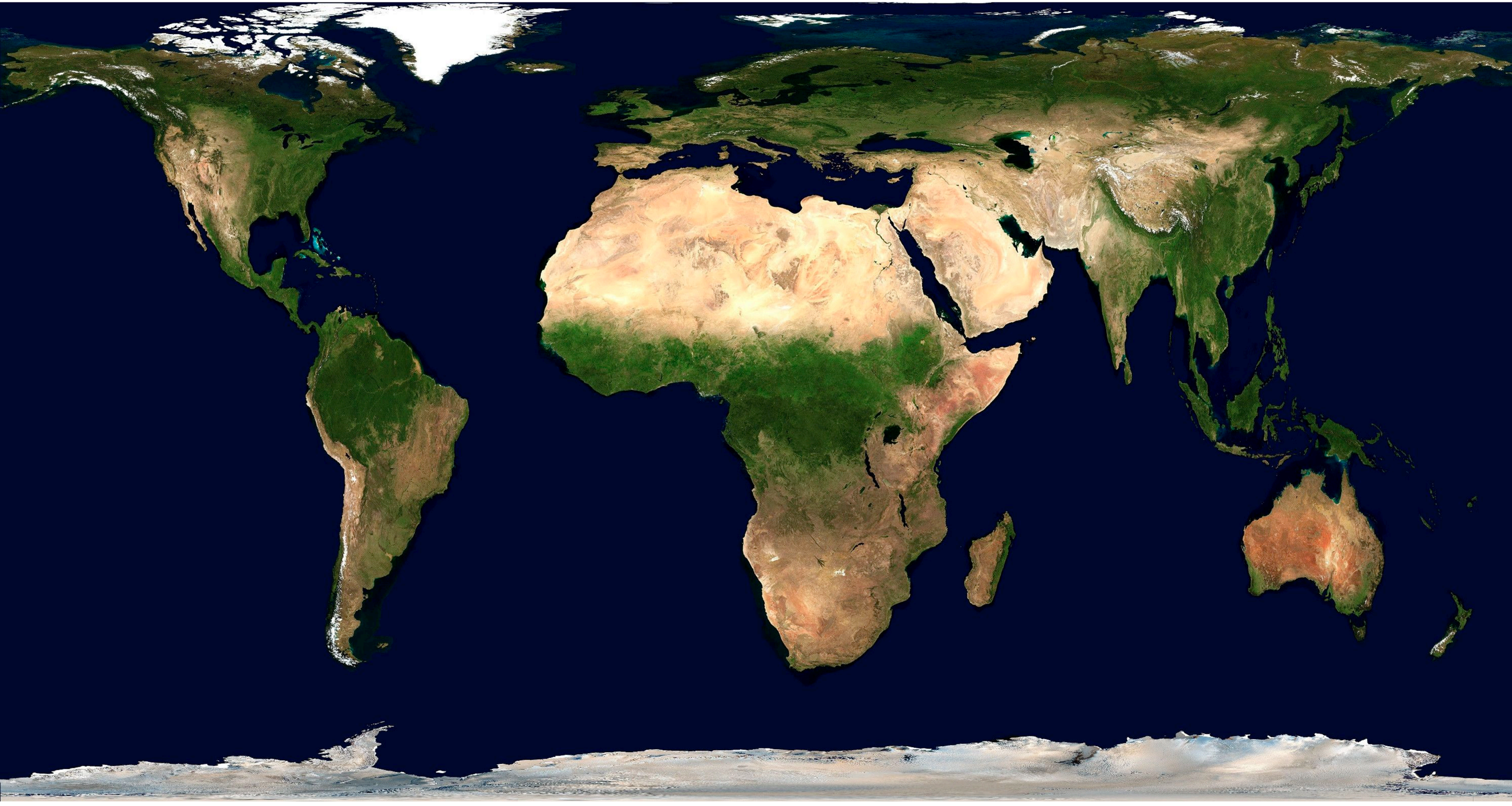
What’s a projection?



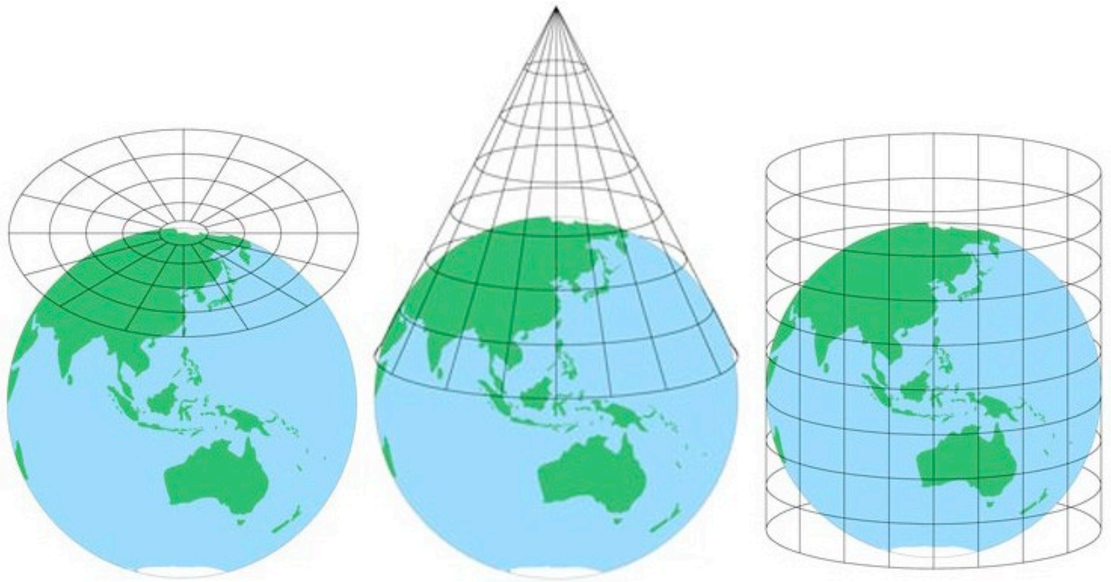



Sunday, 10 February 2019


Switzerland
Netherlands
Belgium
Germany
Ireland
Austria
Italy
France
U.K.
Eastern Europe (partial)
Portugal
Spain
Greece
Contiguous U.S.
India
China
Japan
Graphic by Bryan Christie and Kai Krause, for SCIENTIFIC AMERICAN



Approaches



Azimuthal **Conic** **Cylindrical**