

Today: Maps

Sam Ventura
36-315
Today: Maps

Department of Statistics
Carnegie Mellon University

April 20, 2017

Watch This Video on Map Projections

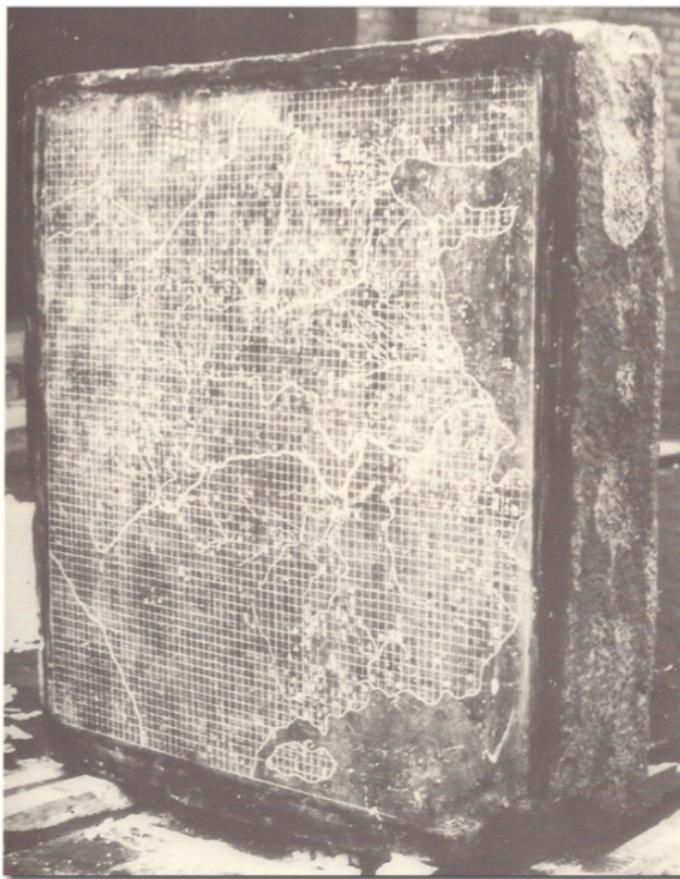
<https://www.youtube.com/watch?v=kIID5FDi2JQ>

Earliest Graphics

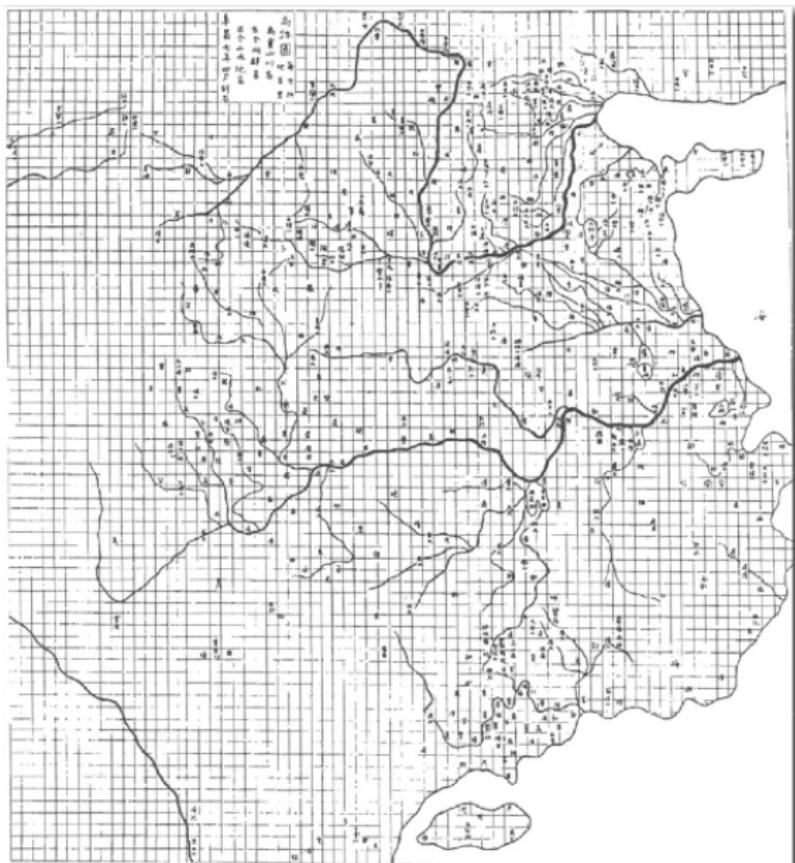
Began with geographic maps:
symbols/colors on clay tablets (5000 years ago)

11th century China: Map of the Tracks of Yu The Great
coastal outline very accurate
high precision of rivers
scale is almost exact
carved into 3-ft wide stone tablet

Map of the Tracks of Yu The Great

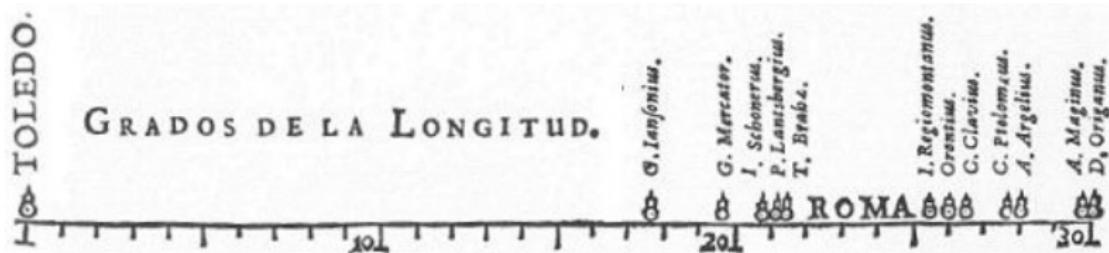


Map of the Tracks of Yu The Great



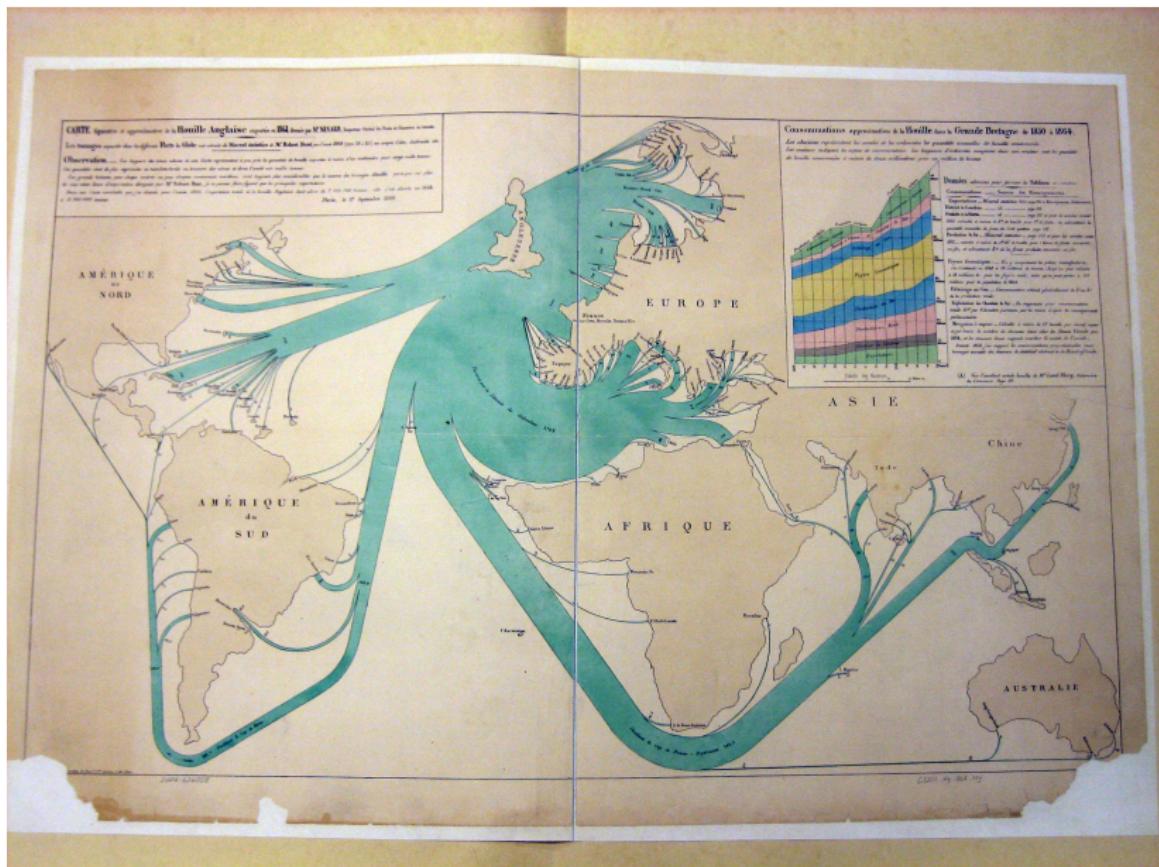
La Verdadera Longitud por Mar y Toledo

Shows statistical information!

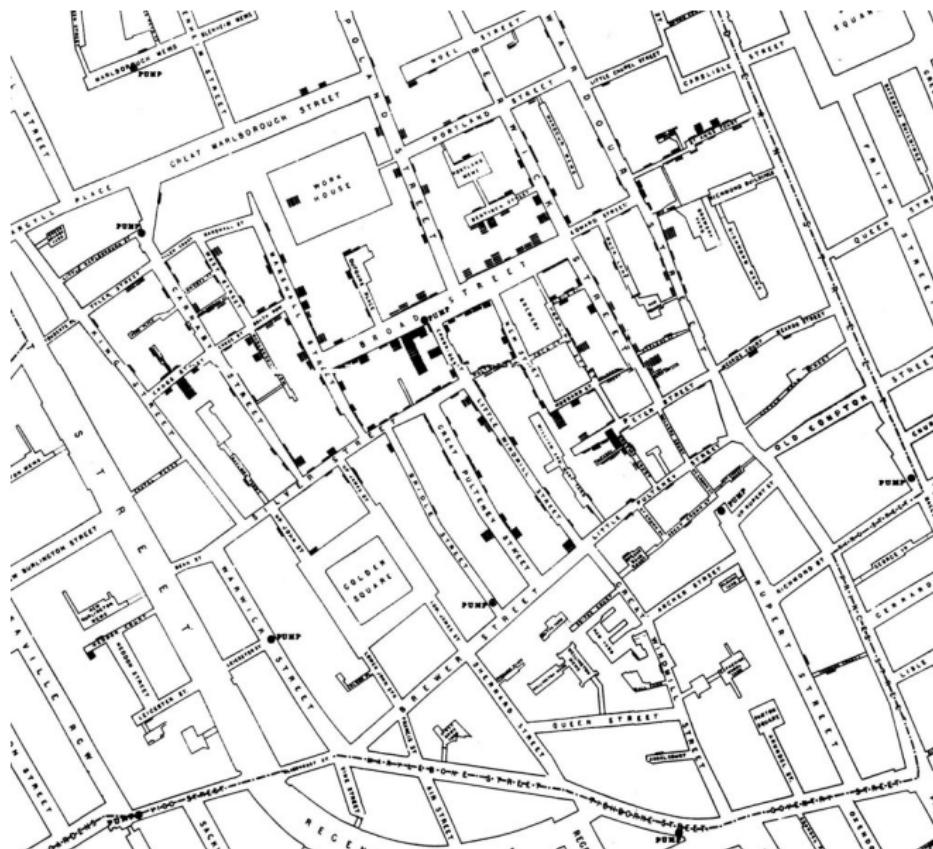


Wide range of estimates of distance from Rome to Toledo

Minard – Exports of French Wine



Cholera Mapping

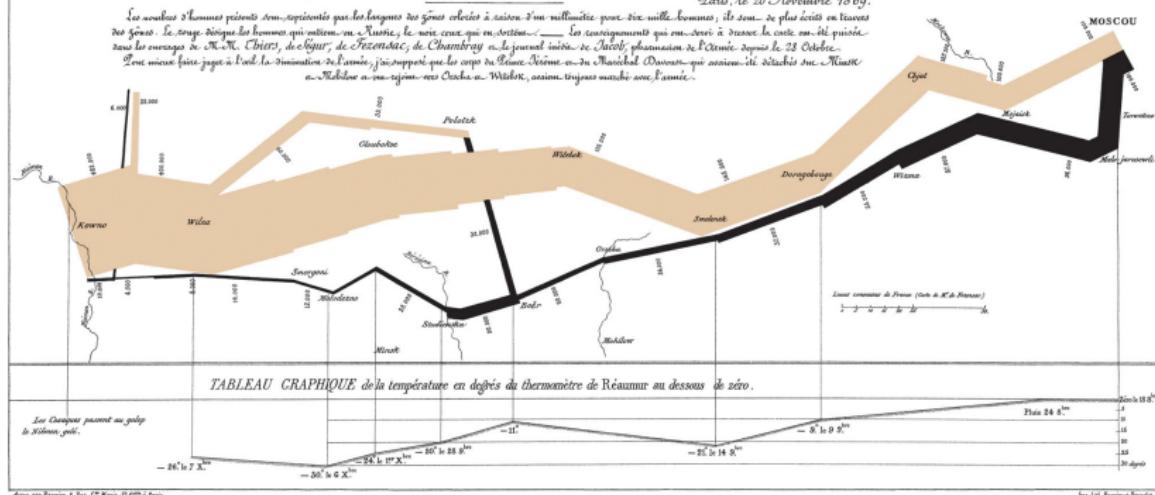


Napoleonic's March To Moscow

Carte Figurative des progrès successifs en bonnes de l'Armée Française dans la campagne de Russie 1812-1813.

Dessiné par M. Minard, Ingénieur Général des Ponts et Chaussées en activité. Paris, le 20 Novembre 1869.

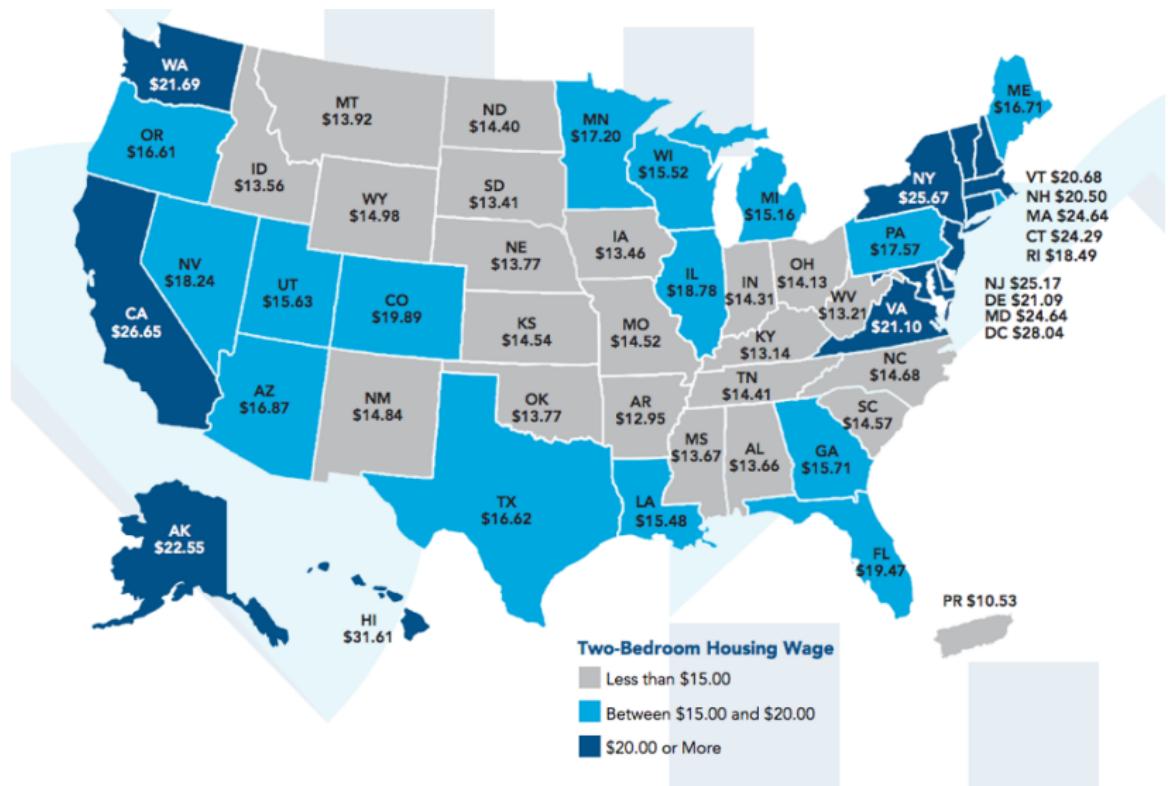
Les courbes d'hommes perdus, représentées par les longues des zones colorées à cause d'un millier pour six mille hommes; de sorte de plus évident en traces des zones. Le rouge indique les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renouvellements qui ont lieu à droite de la carte, ou déplacés dans les envois de M. M. Chabot, de Léger, de Tocat, de Chambry ou du Journal intérieur de Napoléon, illustrent de l'armée depuis le 23 Octobre. — L'armée française ayant à l'aval la dimension de l'armée, j'ai supposé que les corps du Prince Napoléon ou du Maréchal Davout, qui avaient été détachés sur l'Amirauté ou vers l'Asie ou Witek, assisteraient naturellement avec l'armée.



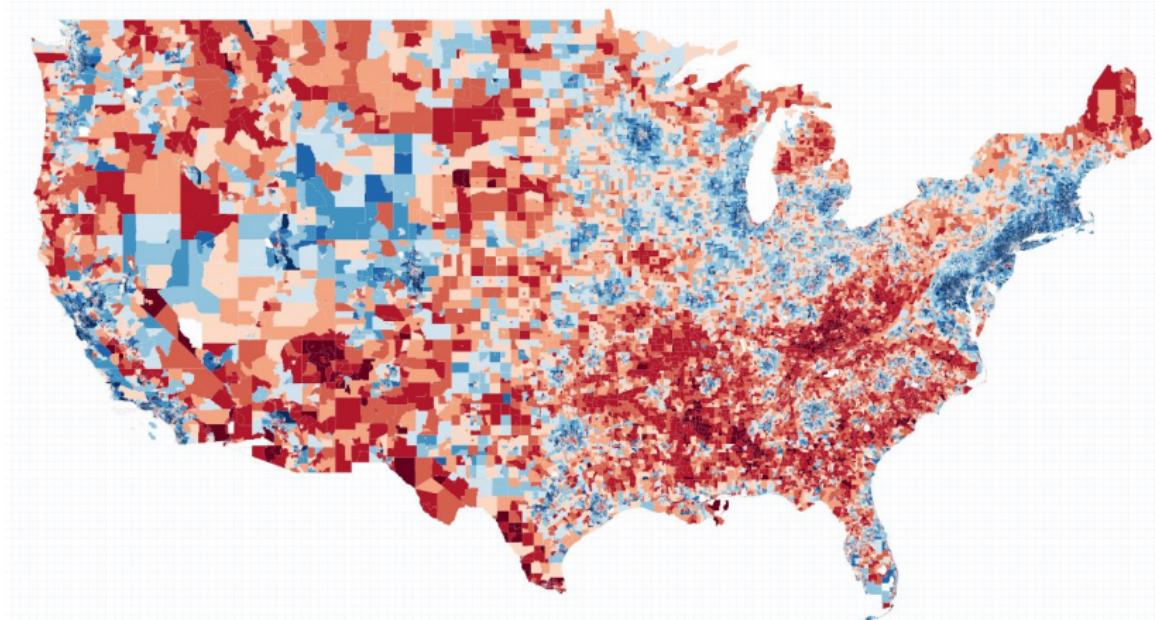
Carte Figurative de l'Armée Française dans la campagne de Russie 1812-1813.

Carte Figurative de l'Armée Française dans la campagne de Russie 1812-1813.

Hourly Wages to Afford Two-Bedroom Apartment



US Income by Census Tract



Maps

Latitude and Longitude:

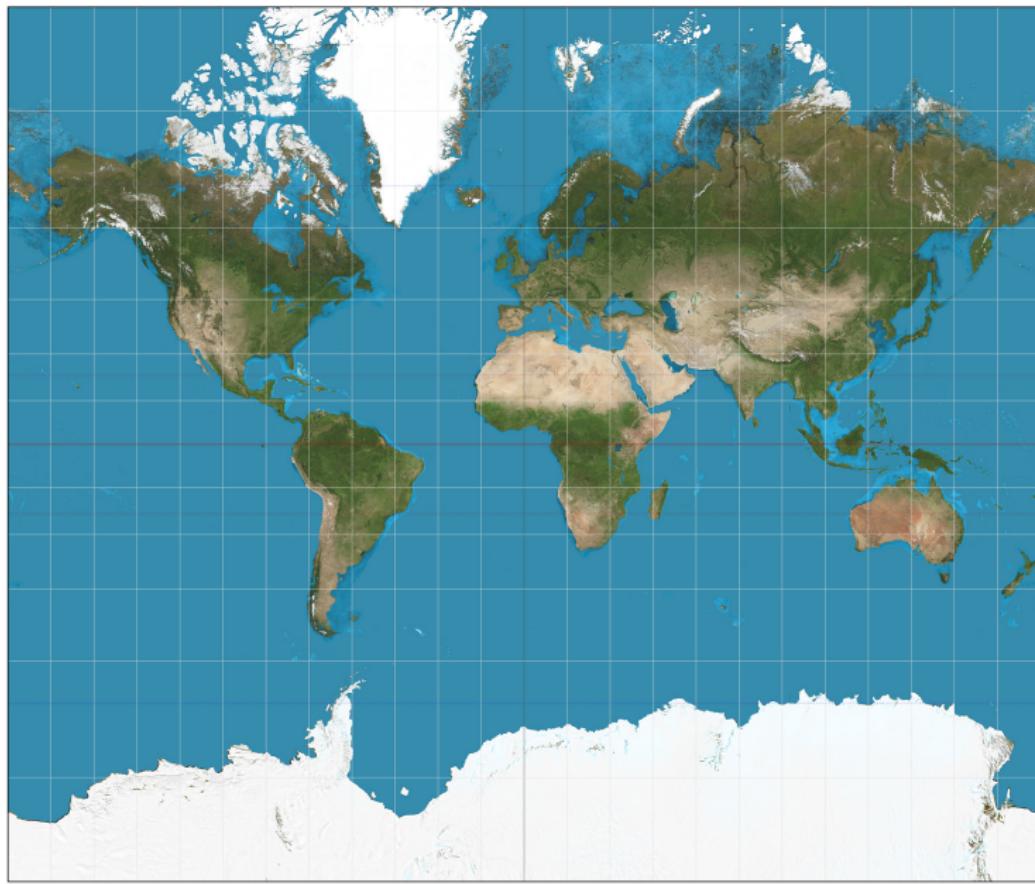
Map Projections

Earth is a 3-D object, but maps are 2-D objects.

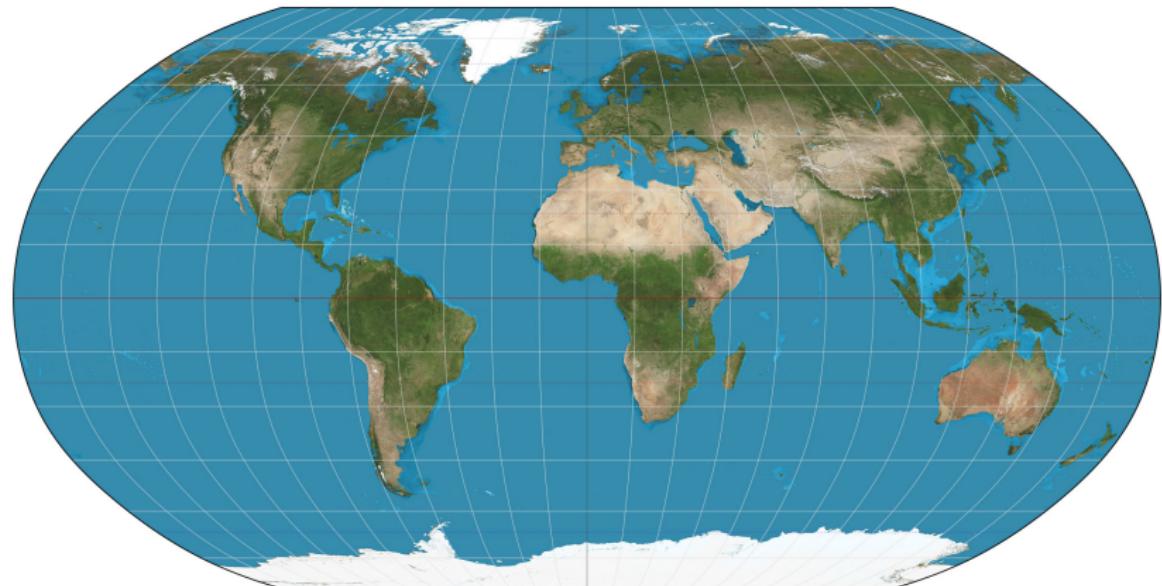
Map Projections:

Common Projections:

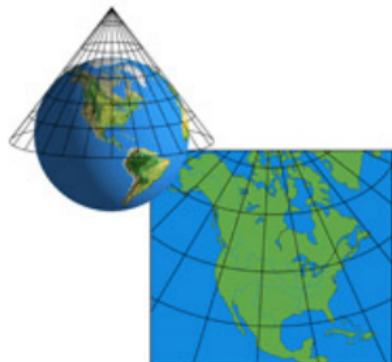
Mercator Projection



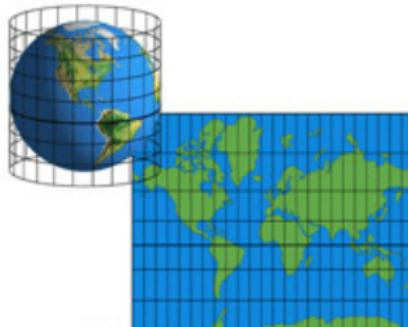
Mercator Projection



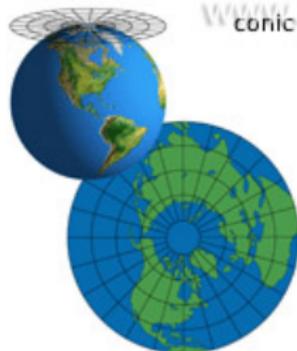
More Projections



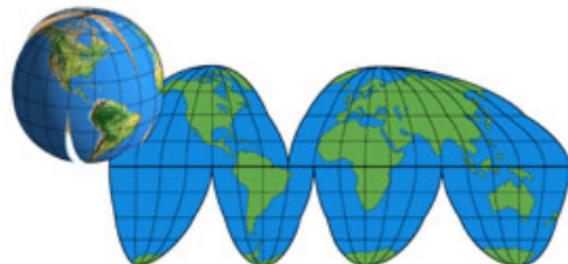
www.visualdictionaryonline.com



cylindrical projection



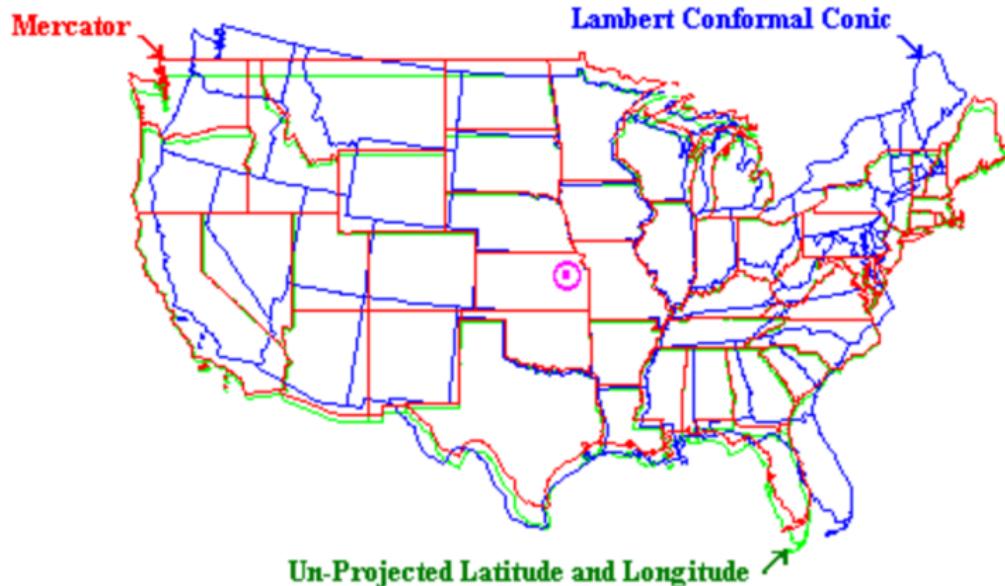
plane projection



interrupted projection

US Projections

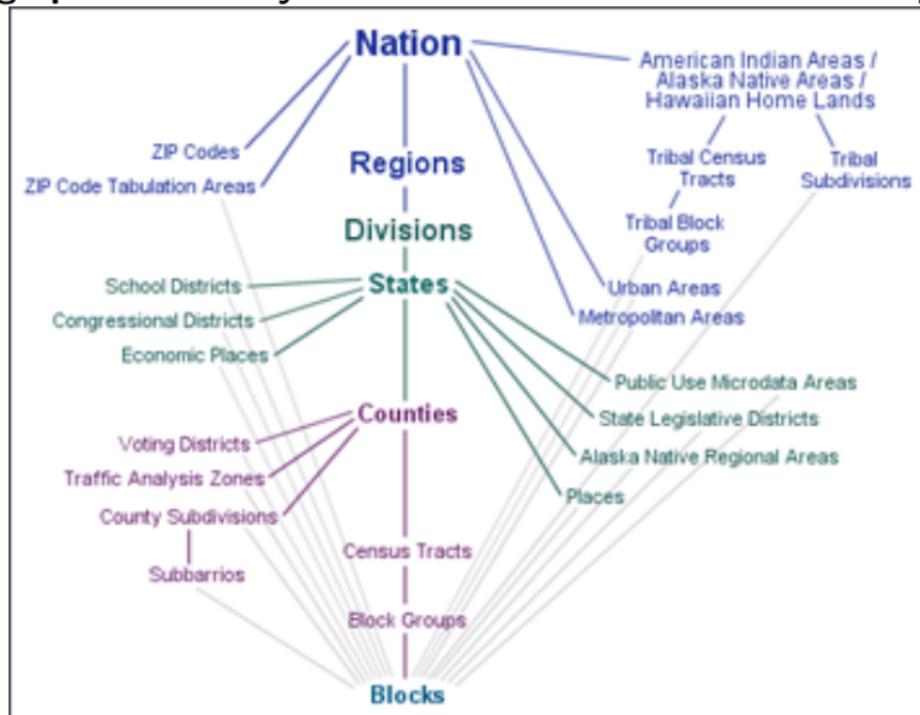
Three Map Projections Centered at 39 N and 96 W



Peter H. Dana 6/23/97

Census Geographies

Geographic Hierarchy for Government Administrative Purposes



Maps in R (and other software/tools) with Shapefiles

Shapefiles: