

# Today: Maps

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36-315  
Today: Maps

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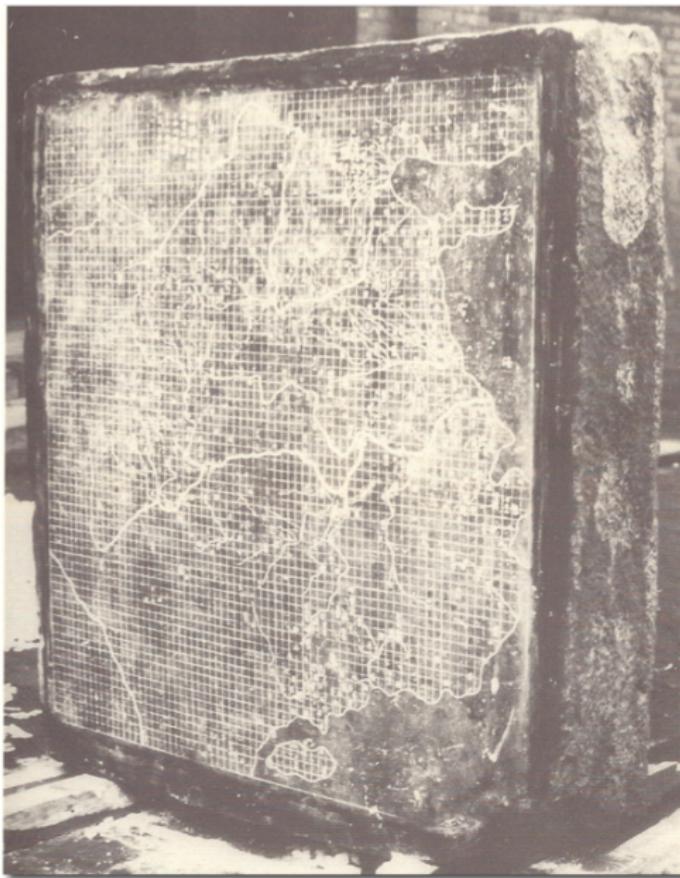
November 14, 2016

## Earliest Graphics

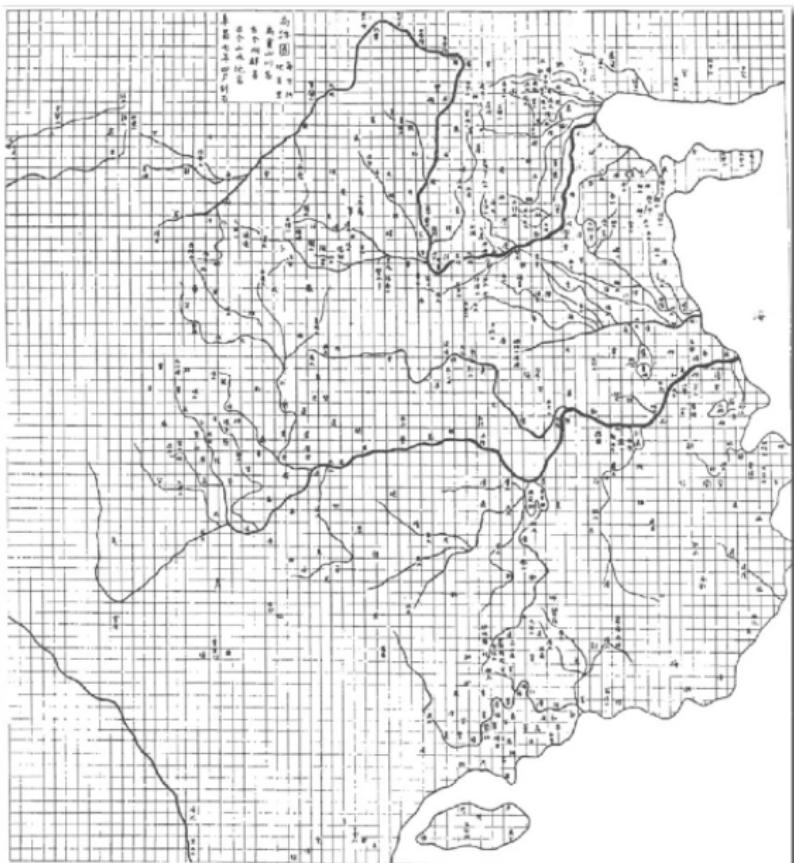
Began with geographic maps:  
symbols/colors on clay tablets (5000 years ago)

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

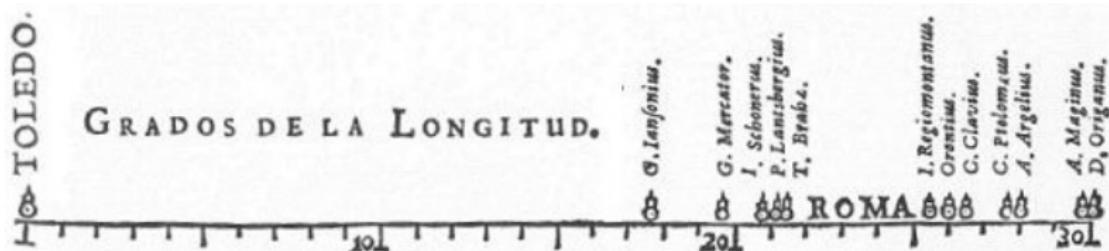


# Map of the Tracks of Yu The Great



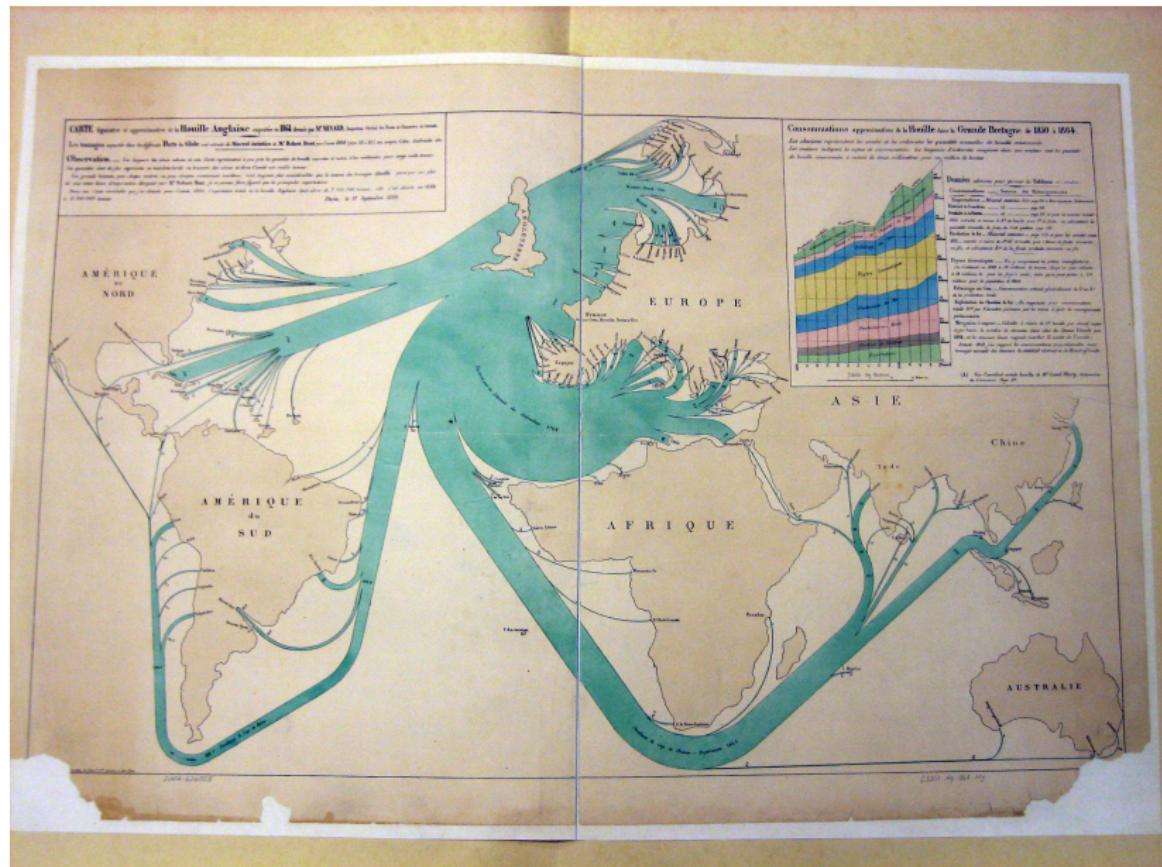
# La Verdadera Longitud por Mar y Toledo

Shows statistical information!

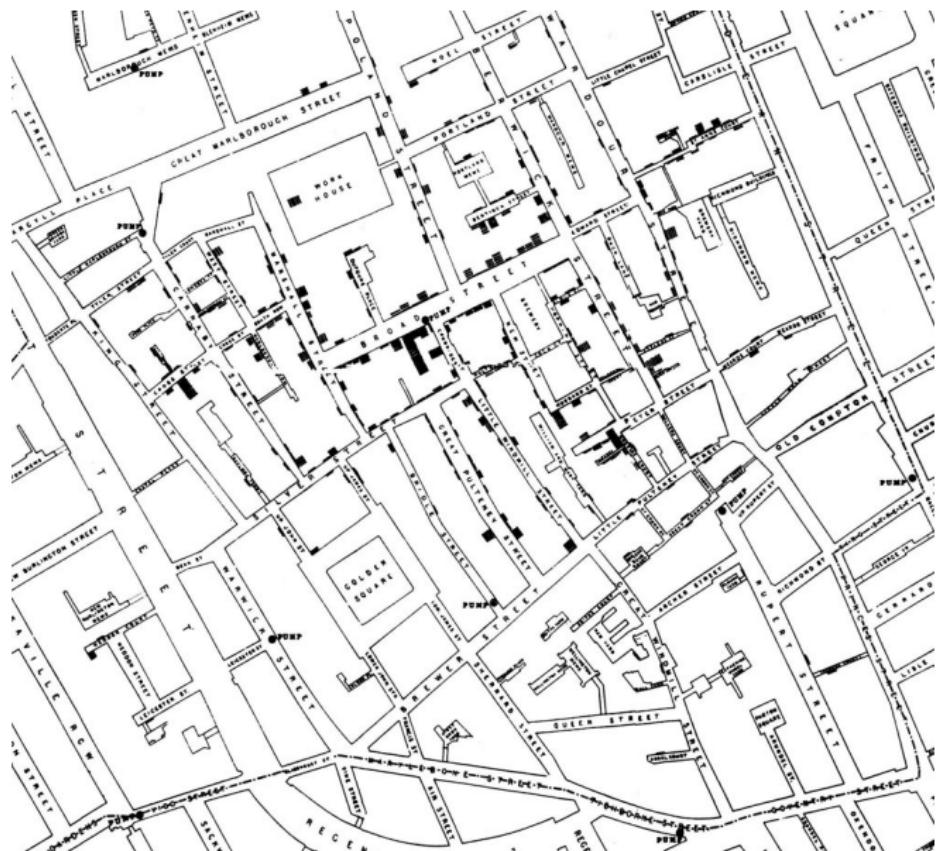


Wide range of estimates of distance from Rome to Toledo

# Minard – Exports of French Wine



# Cholera Mapping

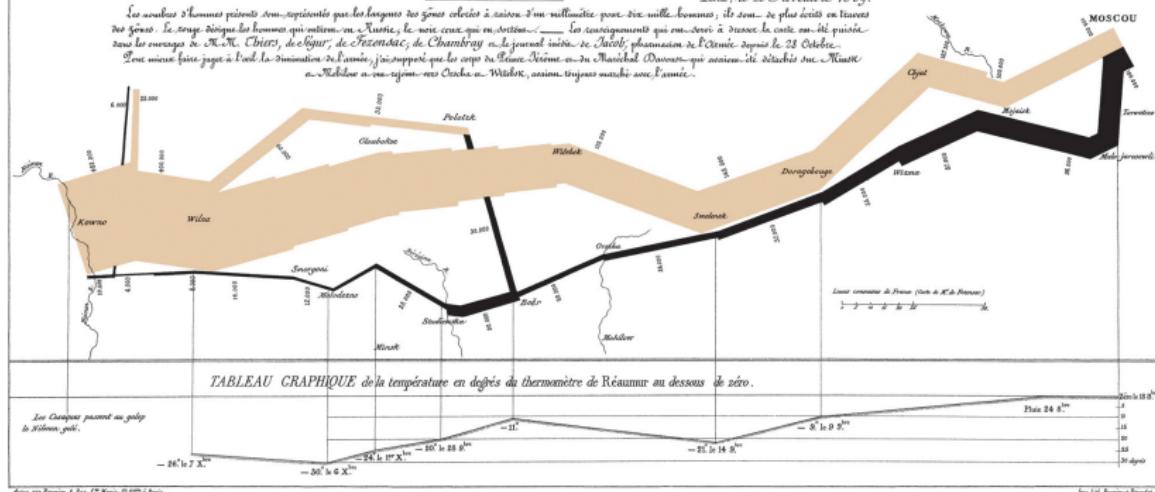


# Napoleonic's March To Moscow

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 détresse. Paris, le 20 Novembre 1869.

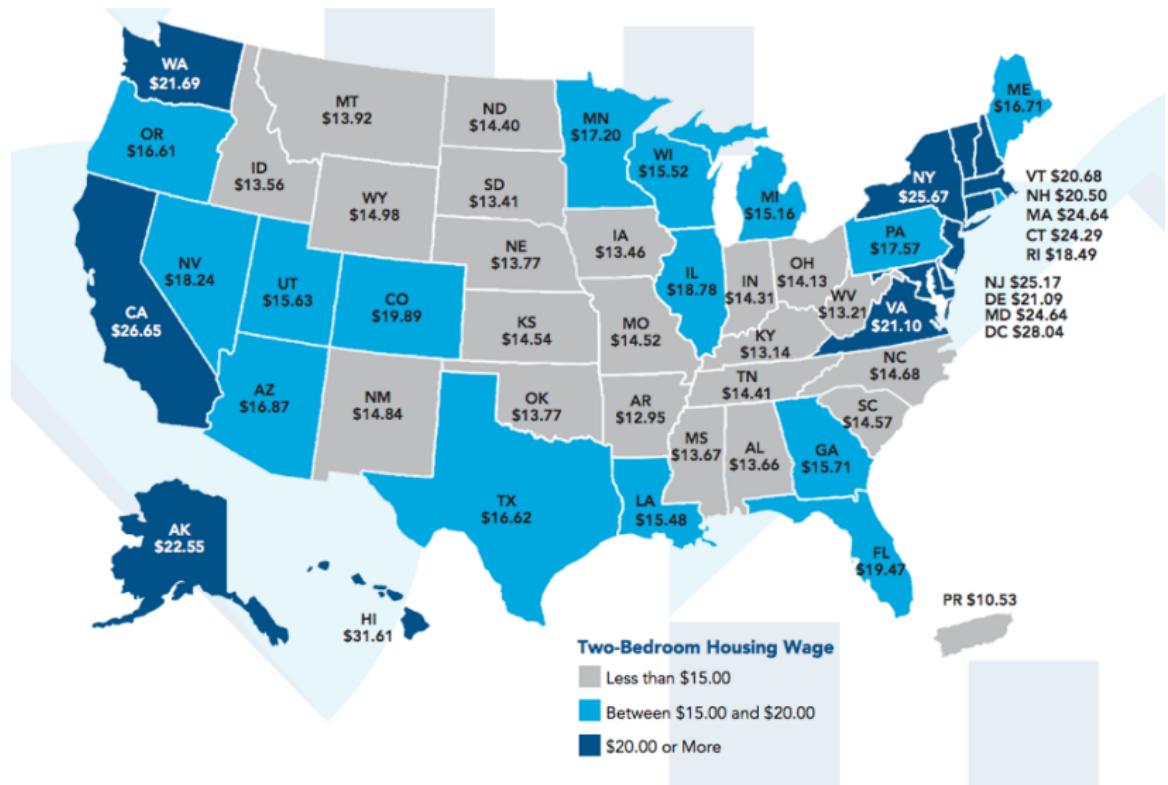
Les courbes d'hommes perdus, représentées par les longues des zones colorées à cause d'un millier pour six mille hommes; de sorte de plus évident en traces des zones. Le rouge indique les hommes qui entrent en Russie, le noir ceux qui en sortent. — Les renouvellements qui ont lieu à droite de la carte, ou déplacés dans les envois de M. M. Chabot, de Léger, de Tocat, de Chambry ou le journal intitulé de Napoléon, plusieurs de l'Armée depuis le 23 Octobre. — Lorsqu'il fait faire à l'aval la division de l'armée, j'ai supposé que les corps du Prince Napoléon ou du Maréchal Davout, qui avaient été détachés sur Napoléon ou sur l'armée de l'Ouest ou de l'Est, étaient unis avec l'armée.



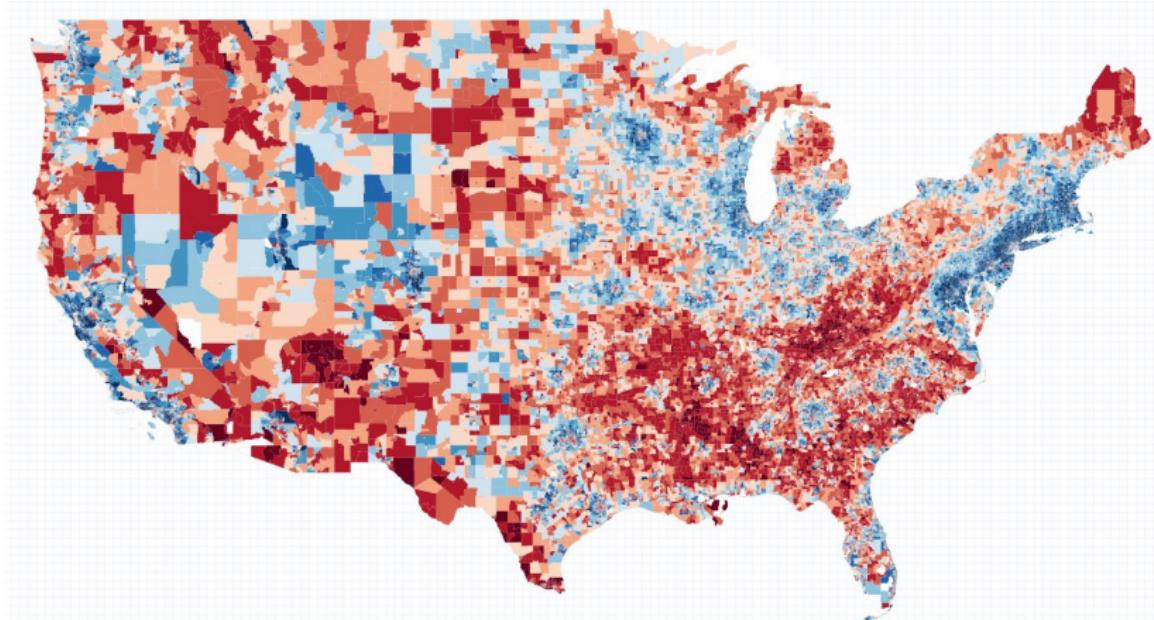
Carte par Ruyer, E. Par J<sup>e</sup> Ruyer à Paris.

Imp. Litt. Ruyer et Bourdet.

# Hourly Wages to Afford Two-Bedroom Apartment



# US Income by Census Tract



# Maps

## **Latitude and Longitude:**

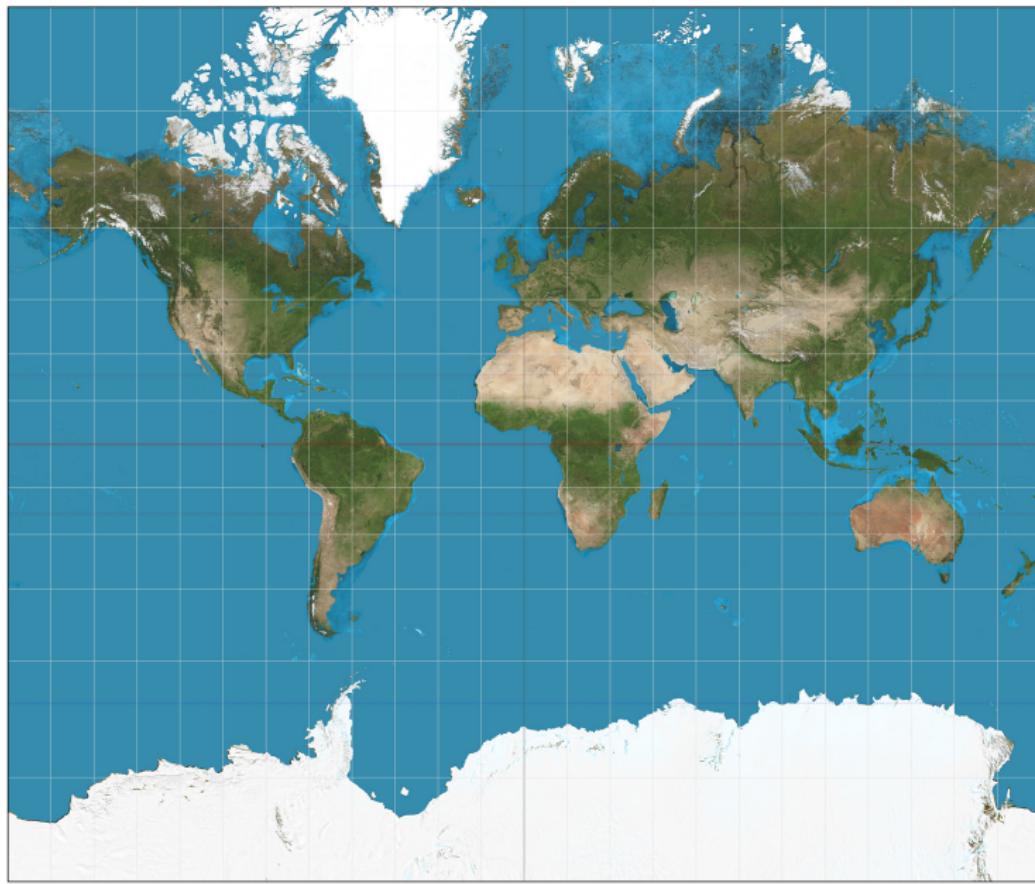
# **Map Projections**

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

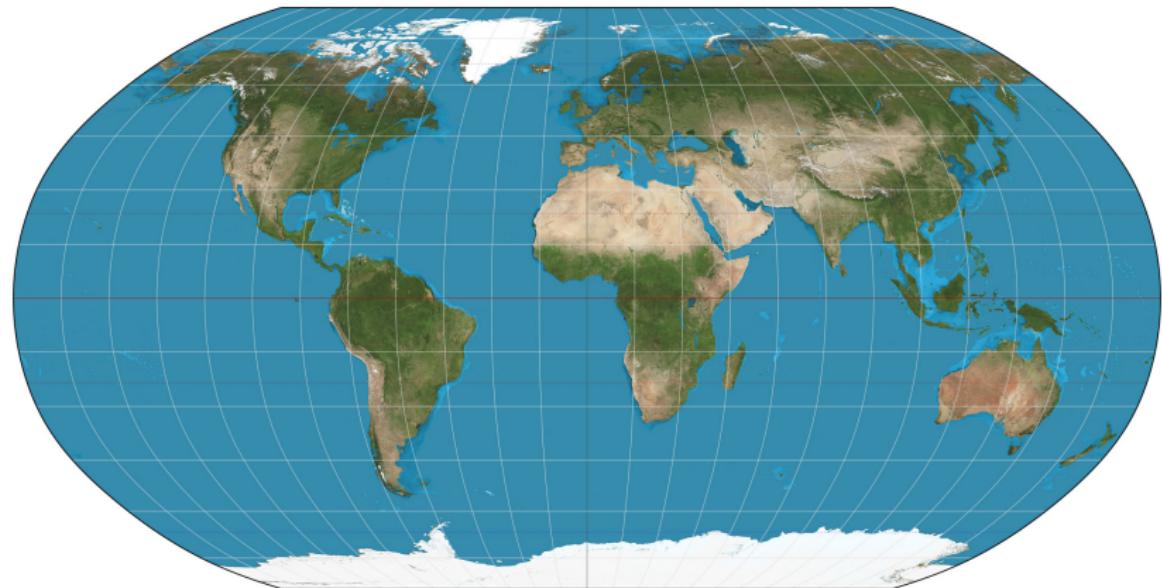
**Map Projections:**

**Common Projections:**

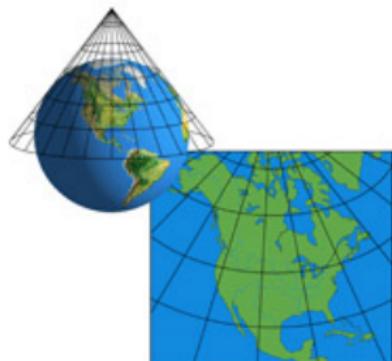
# Mercator Projection



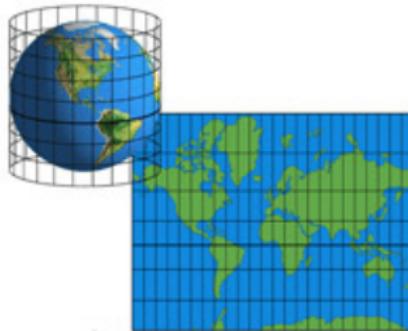
# Mercator Projection



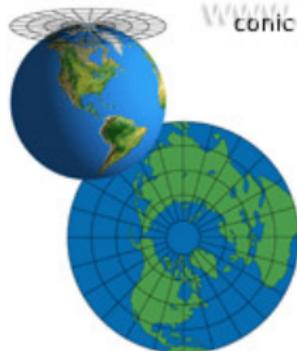
## More Projections



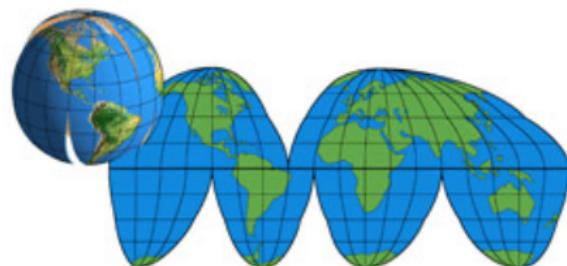
conic projection



cylindrical projection



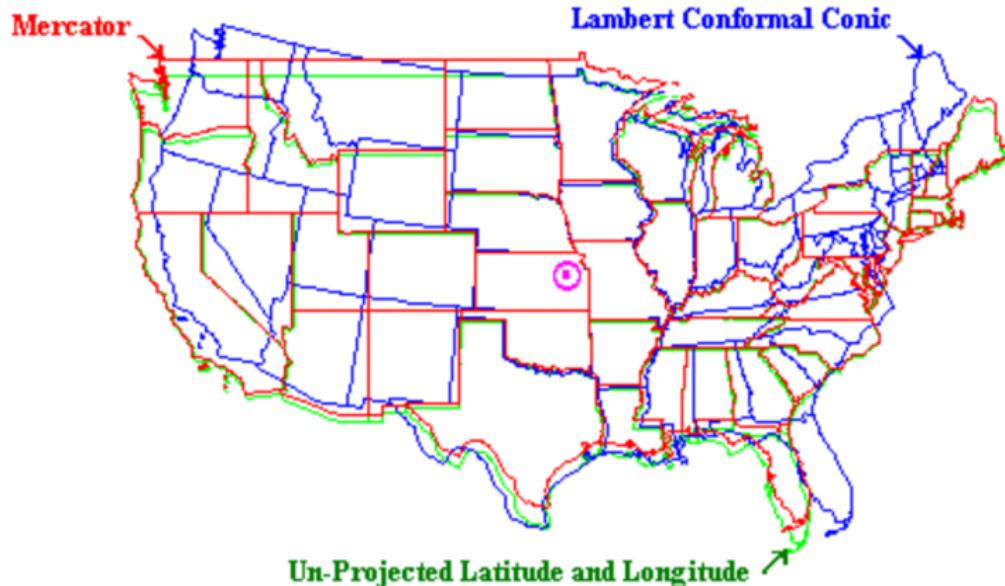
plane projection



interrupted projection

# US Projections

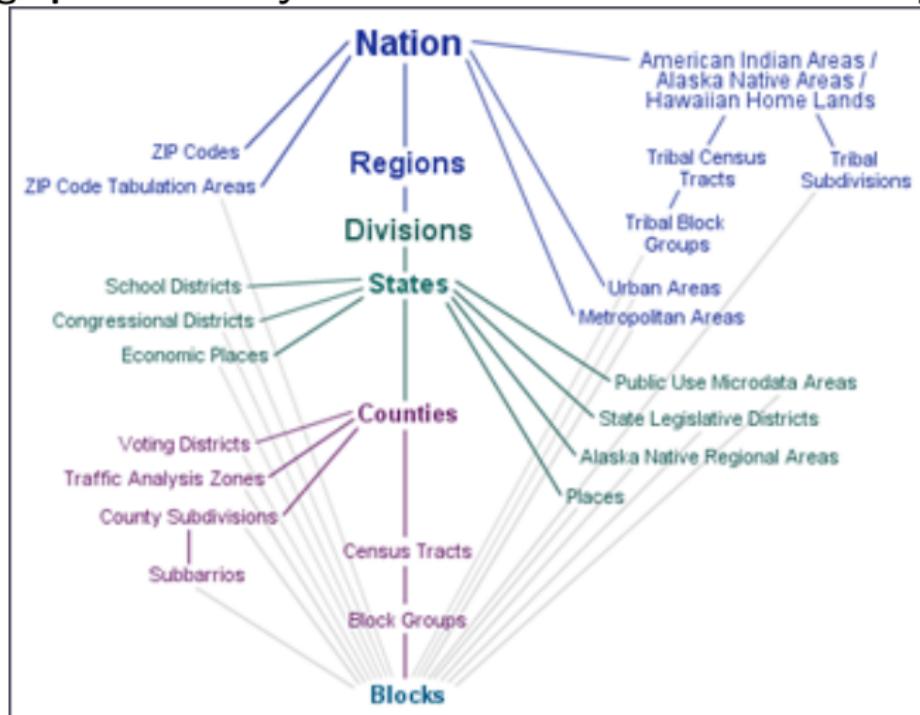
Three Map Projections Centered at 39 N and 96 W



Peter H. Dana 6/23/97

# Census Geographies

## Geographic Hierarchy for Government Administrative Purposes



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

**Shapefiles:**