

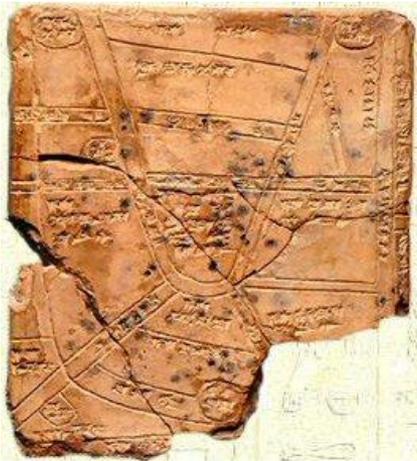


Maps



History of Cartography, the art and science of making maps

~2300 BC



~600 BC



← Early oldest known maps:
Babylonian clay tablets.

Greek and Roman →
Ptolemy's (about AD 85-165) "world map" depicted the Old World from about 60°N to 30°S latitudes.



History of Cartography, the art and science of making maps

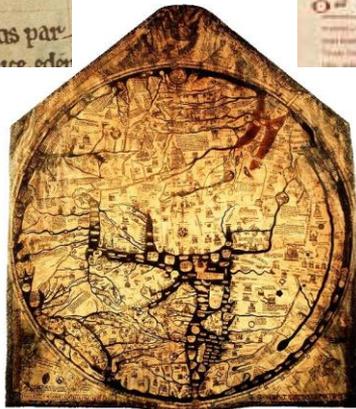
- Before 15th century, maps were hand drawn which made their distribution extremely limited.



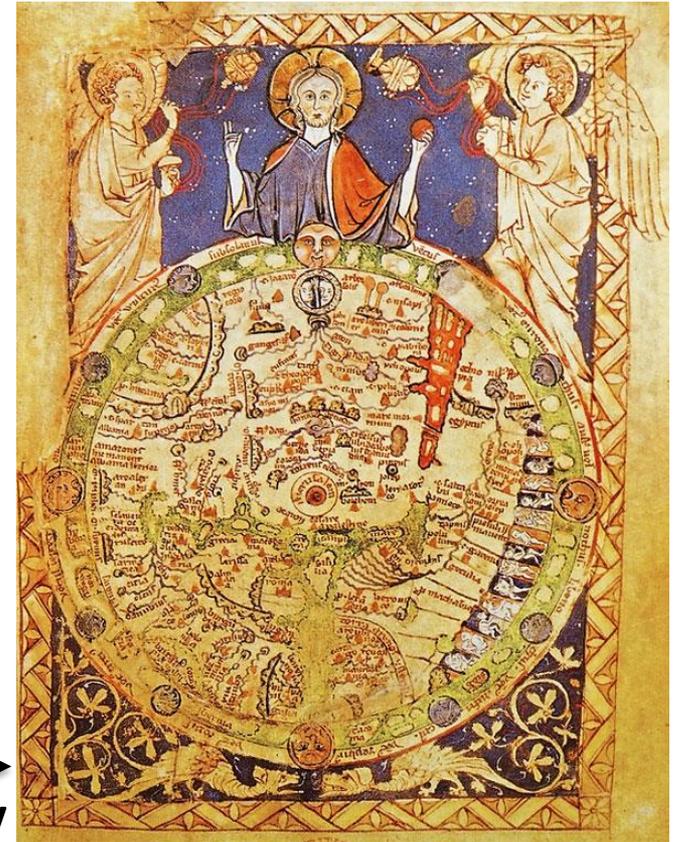
12th century



Isidore ↑
11th century



Hereford
~1280 →

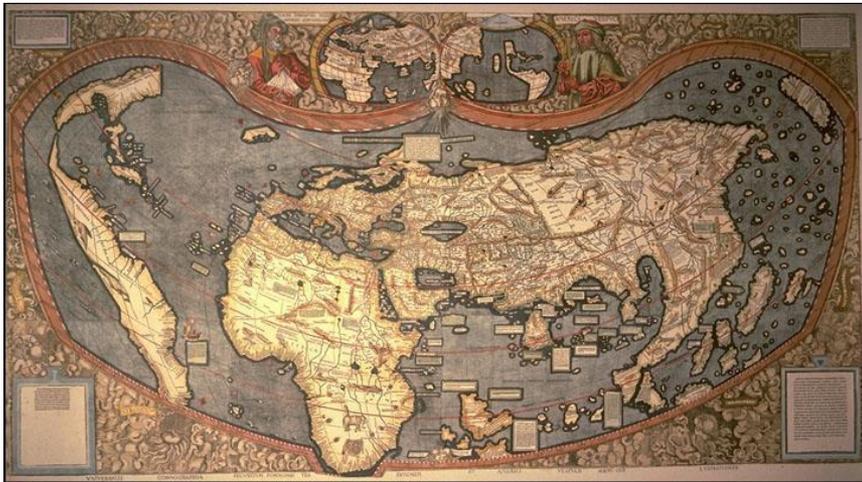


Psalter →
13th century

- Medieval “T-O maps” were dominated by religious views.

History of Cartography

Renaissance maps: beginning in the 15th century, the invention of printing made maps much more widely available. First **whole-world maps** began to appear in the early 16th century following voyages by Columbus and others to the *New World*.



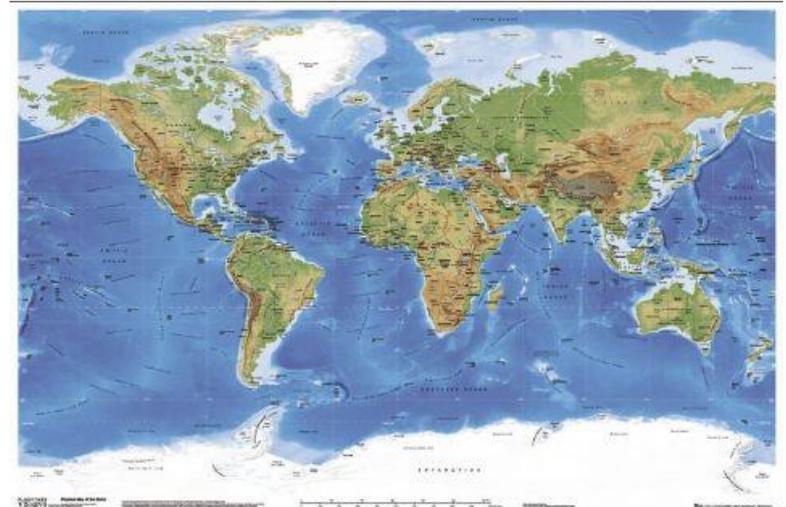
*First map to use the name
"America" to label the New
World, ~1507*

Henricus Hondius, 1633



From Globe to Map

- A map is a graphic representation of geographic information on a flat surface.
- **Transferring** information from the spherical, or ball-shaped, surface of Earth onto a flat piece of paper is called **projection**.



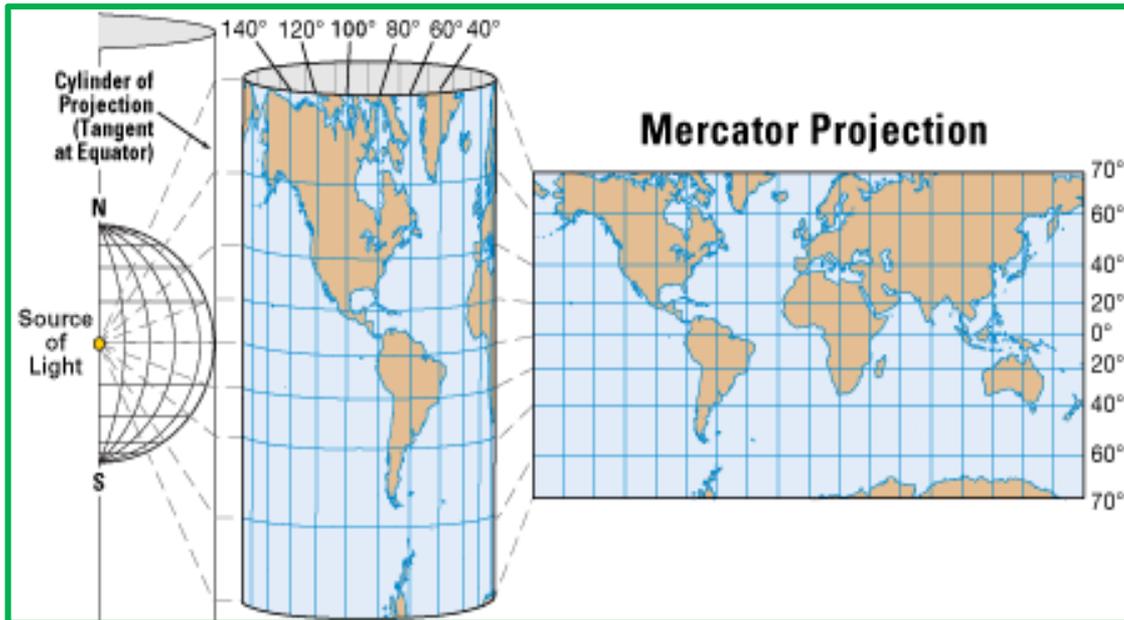
A globe, a spherical model of Earth, **accurately represents** the shapes and locations of the continents.

What about a map?

Map Projections

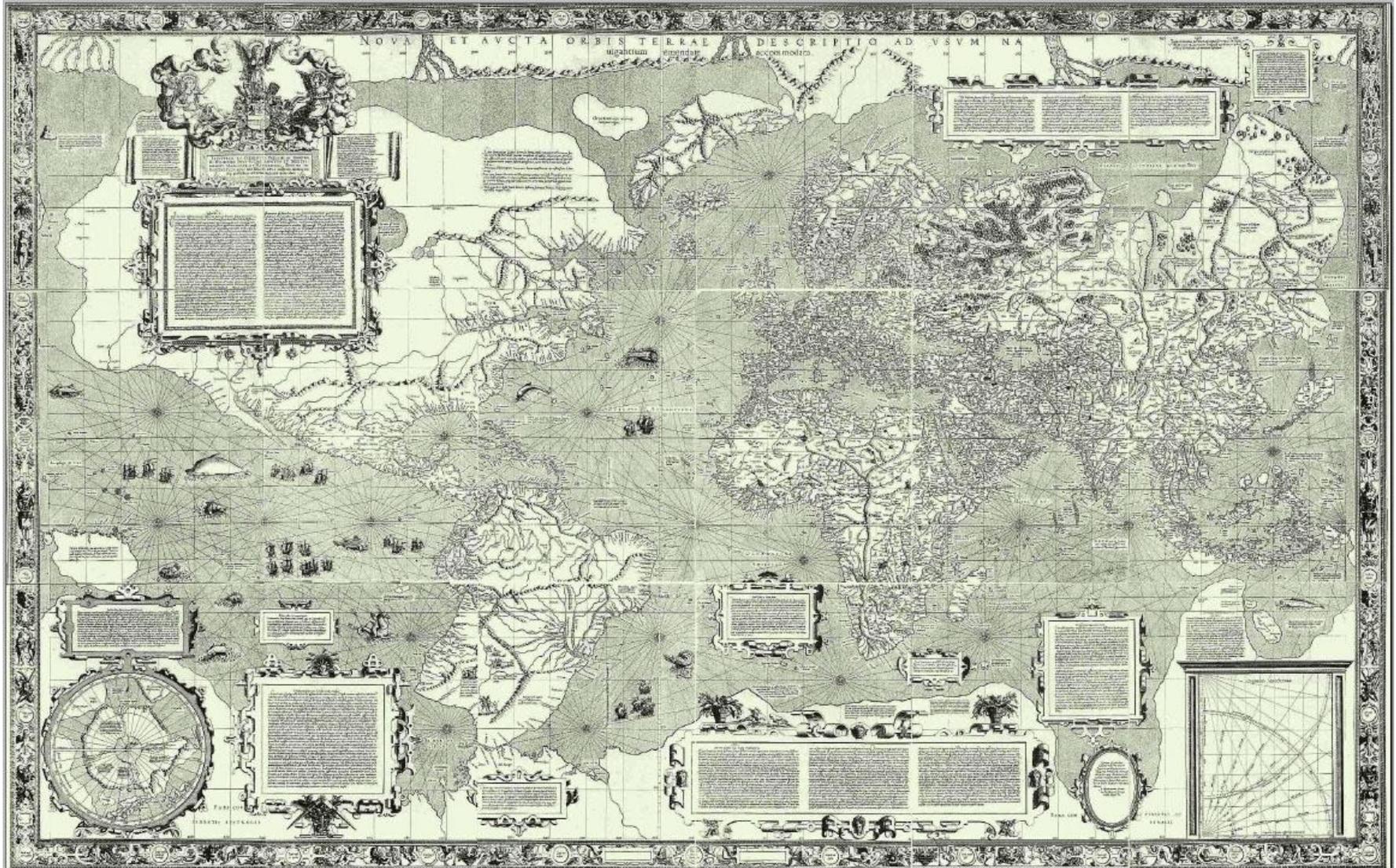


Projection is a **major challenge** for cartographers. Every map has some sort of distortion: it can retain ***either* the correct sizes of landmasses *or* the correct shapes of very small areas, ***but not both***.**



- **Cylindrical** (Mercator): projection onto a tube that is wrapped around the globe and touches it along one line, most often the Equator (the regions **near the Equator** are the **most accurate**, regions **near the poles** are the **most distorted**).

1679 Mercator Map of the World



Direction: Tricky Questions

Where are you going to get to if you go:

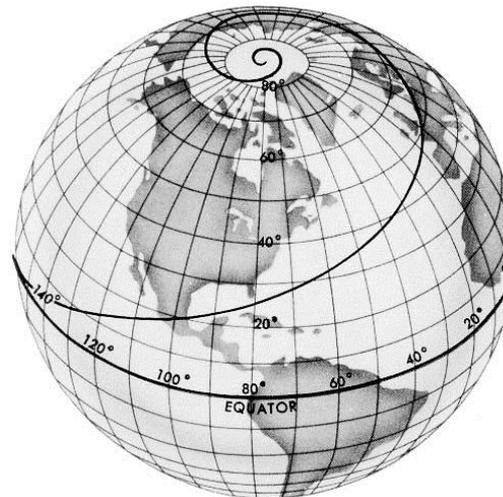


**North?
West?**

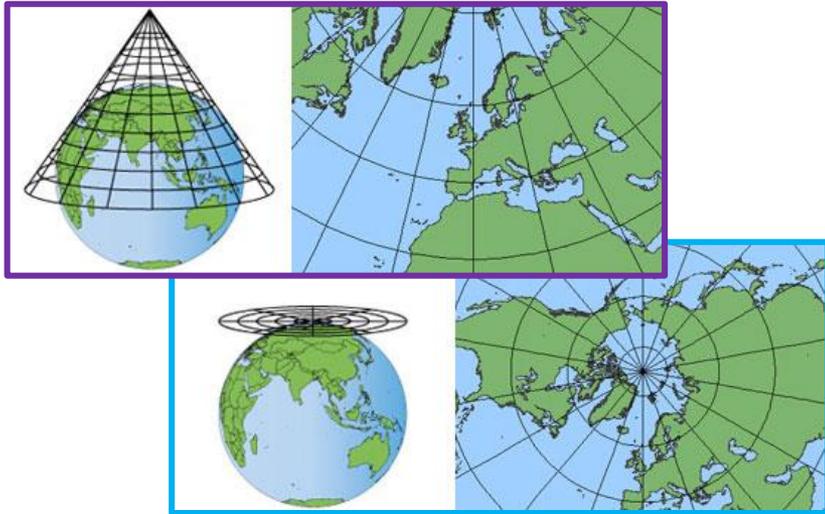
**South?
East?**

**Northeast?
Southwest?**

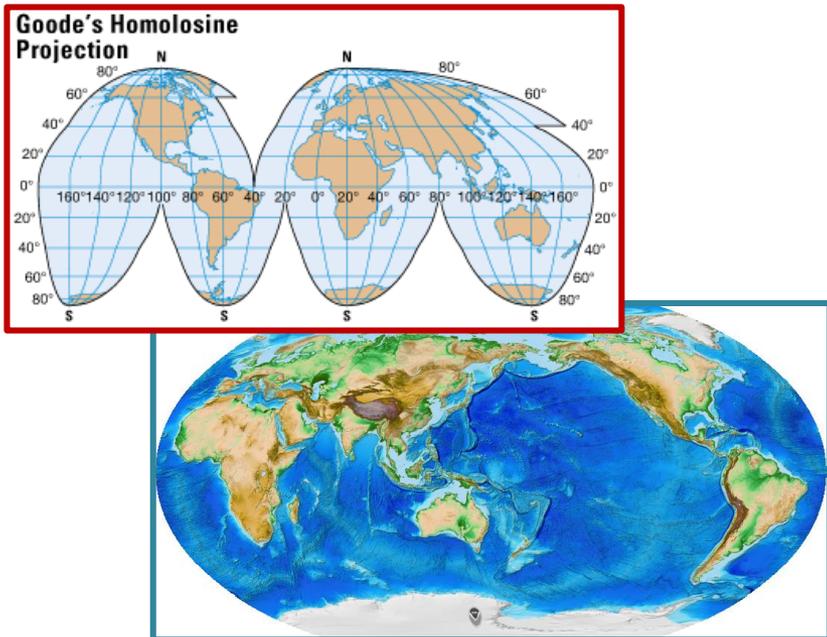
**ENE?
WSW?**



More Map Projections



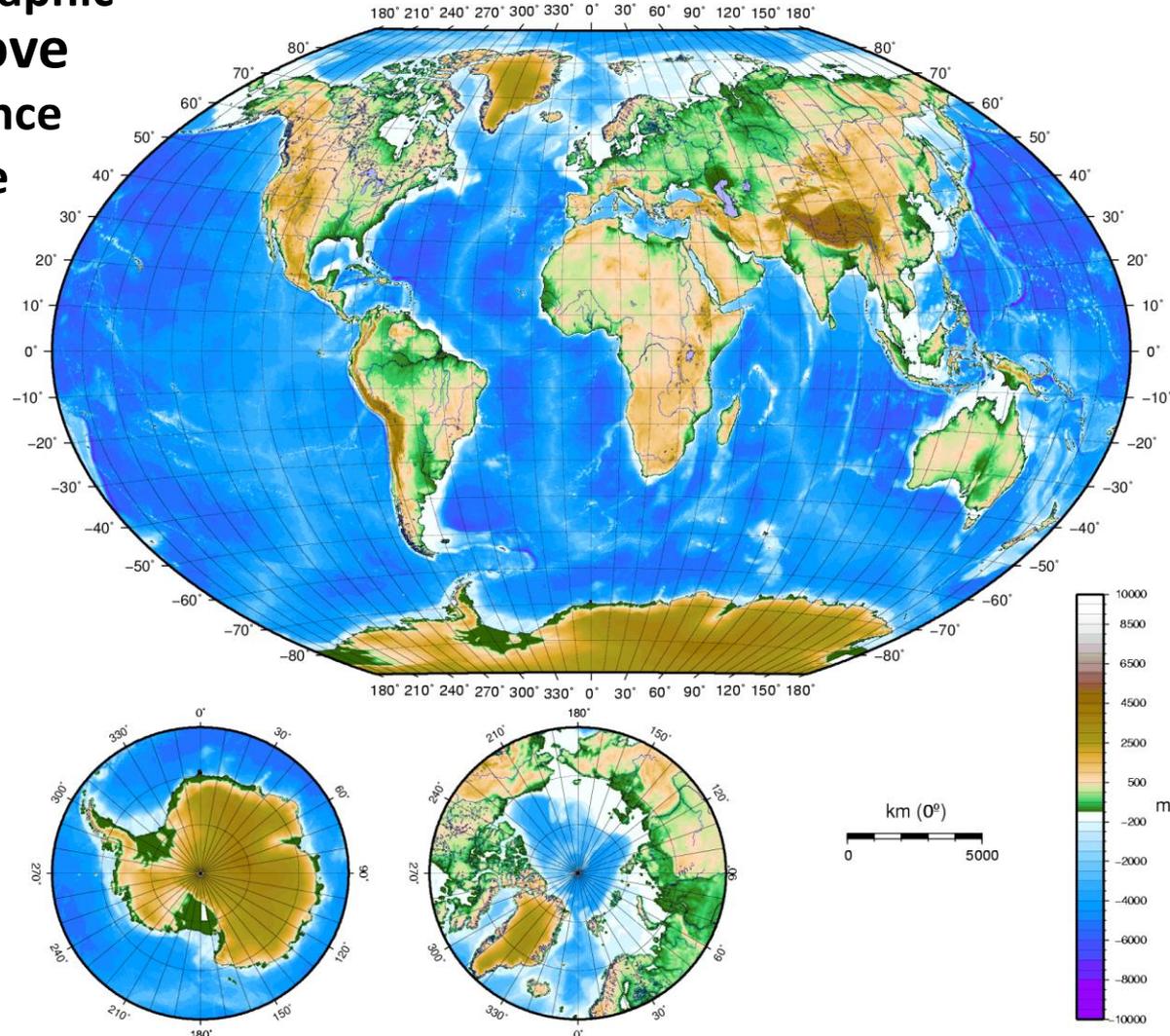
- **Conical**: projection on a flattened cone, with curved lines of latitude and straight meridians (great for mapping mid-latitudes, for example the US Map).
- **Planar**: projection onto a plane with a single point of contact (most accurate at that point; often used for maps of one of the poles).
- **Interrupted**: "orange-peel map" equal-area projection (preserves area measure, generally distorting shapes).
- **Winkel-Tripel**: compromise projection; it minimizes all three kinds of distortion - area, direction and distance.



Mapping Elevation

The elevation of a geographic location is its height above (or below) a fixed reference point, most commonly the Earth's sea level.

- The term “**elevation**” is mainly used when referring to points on the Earth's surface.
- “**Altitude**” is used for points above the surface (an aircraft in flight or a spacecraft in orbit).
- “**Depth**” is used for points below the surface.



Geographic Map

Geographic maps can be classified into categories by:

- Purpose:

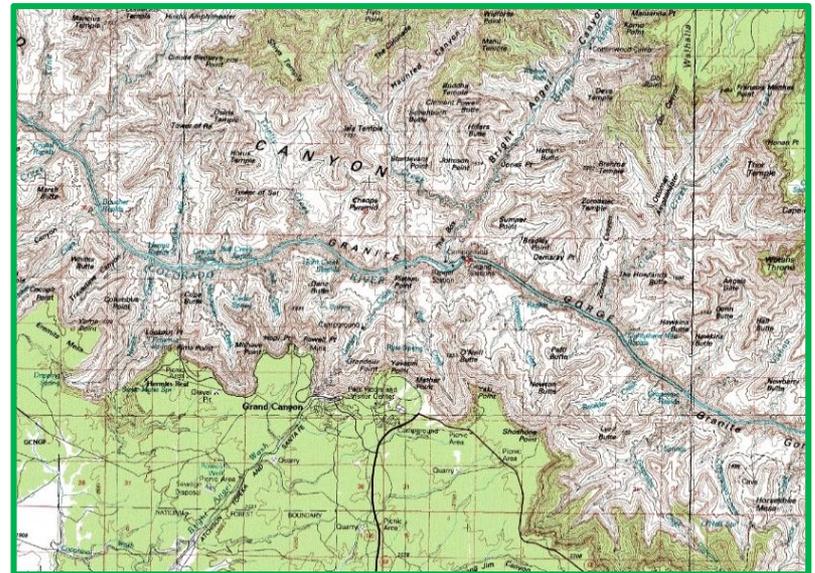
- **General** (variety of features for a general audience)
- **Thematic** (specific geographic themes)



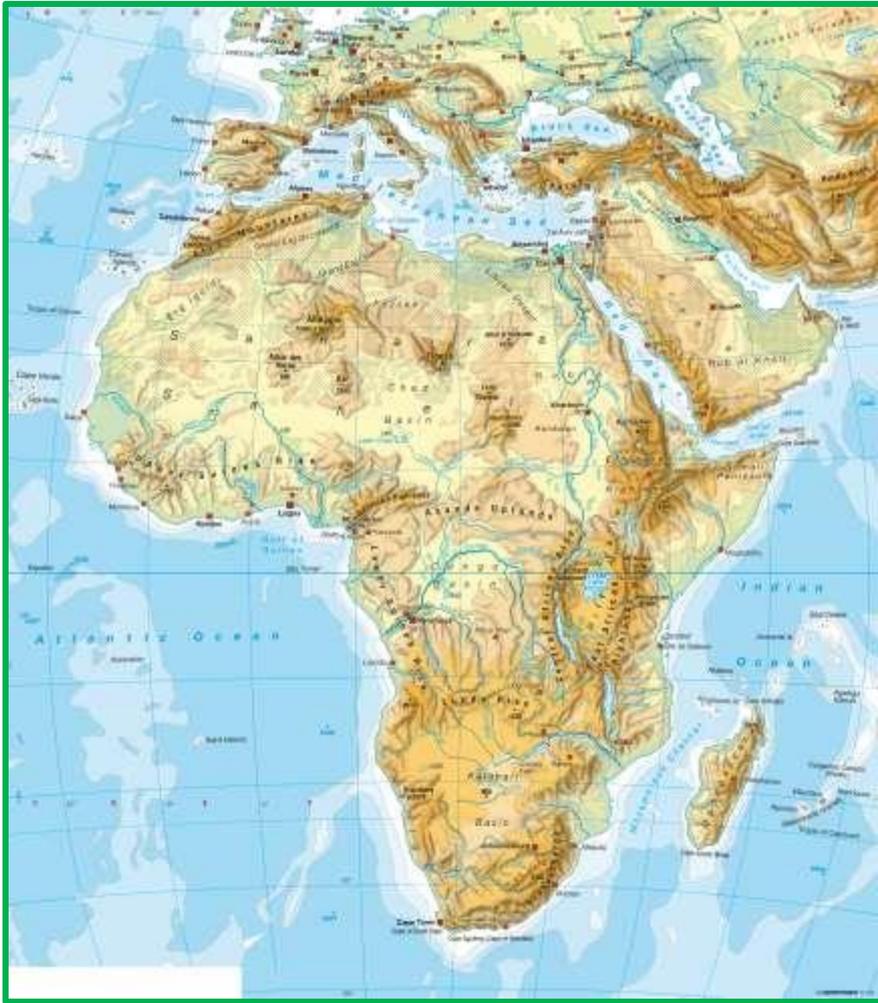
NY City Subway Map

- Detail level:

- **Topographic** (detailed and accurate; large-scale detail and quantitative representation of relief using contour lines)
- **Topological** (simplified so that only vital information remains; lack of true scale, distance and direction)



Types of Maps



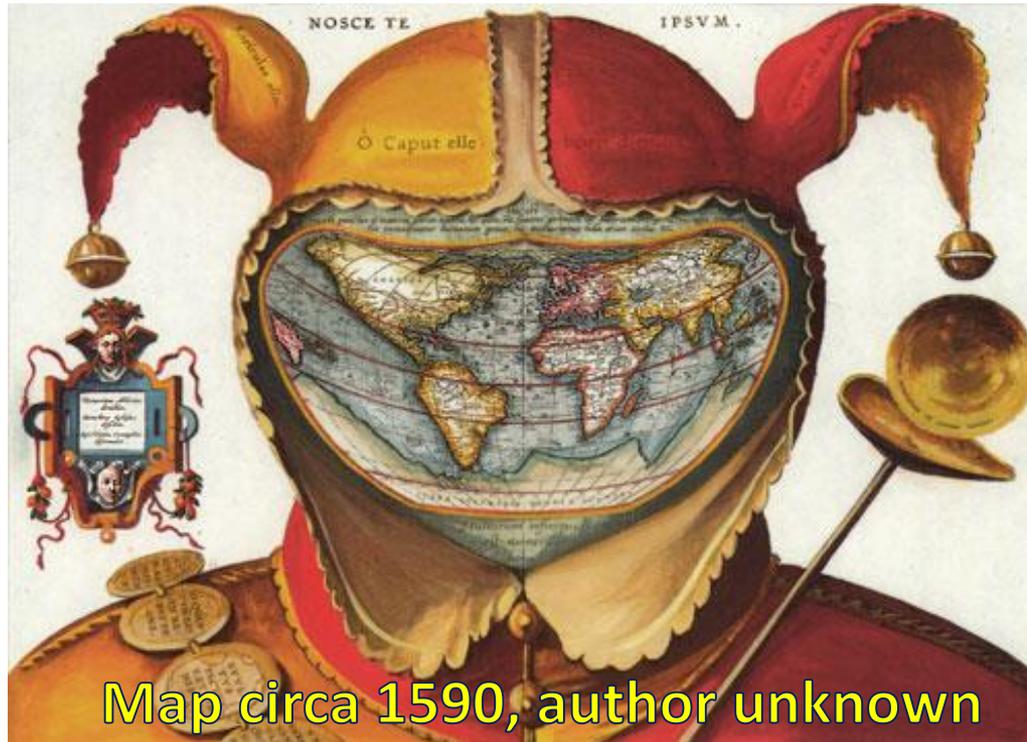
Physical



Political

The Fool's Cap World Map

Are maps realistic representations of the actual world?



**Not
really!**

A map can display **only** a *few selected features*, usually in *highly symbolic styles*.

All maps are **estimations, generalizations, and interpretations** of true geographic conditions, made according to certain basic **assumptions** which are not always true or verifiable.