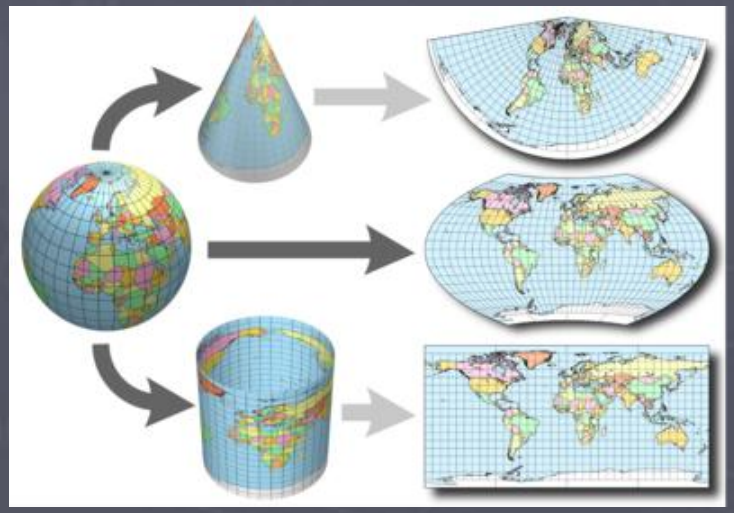
Exploring Map Projections

Warm-Up

- What is the difference between these three maps? What might explain the difference?

Map Projections

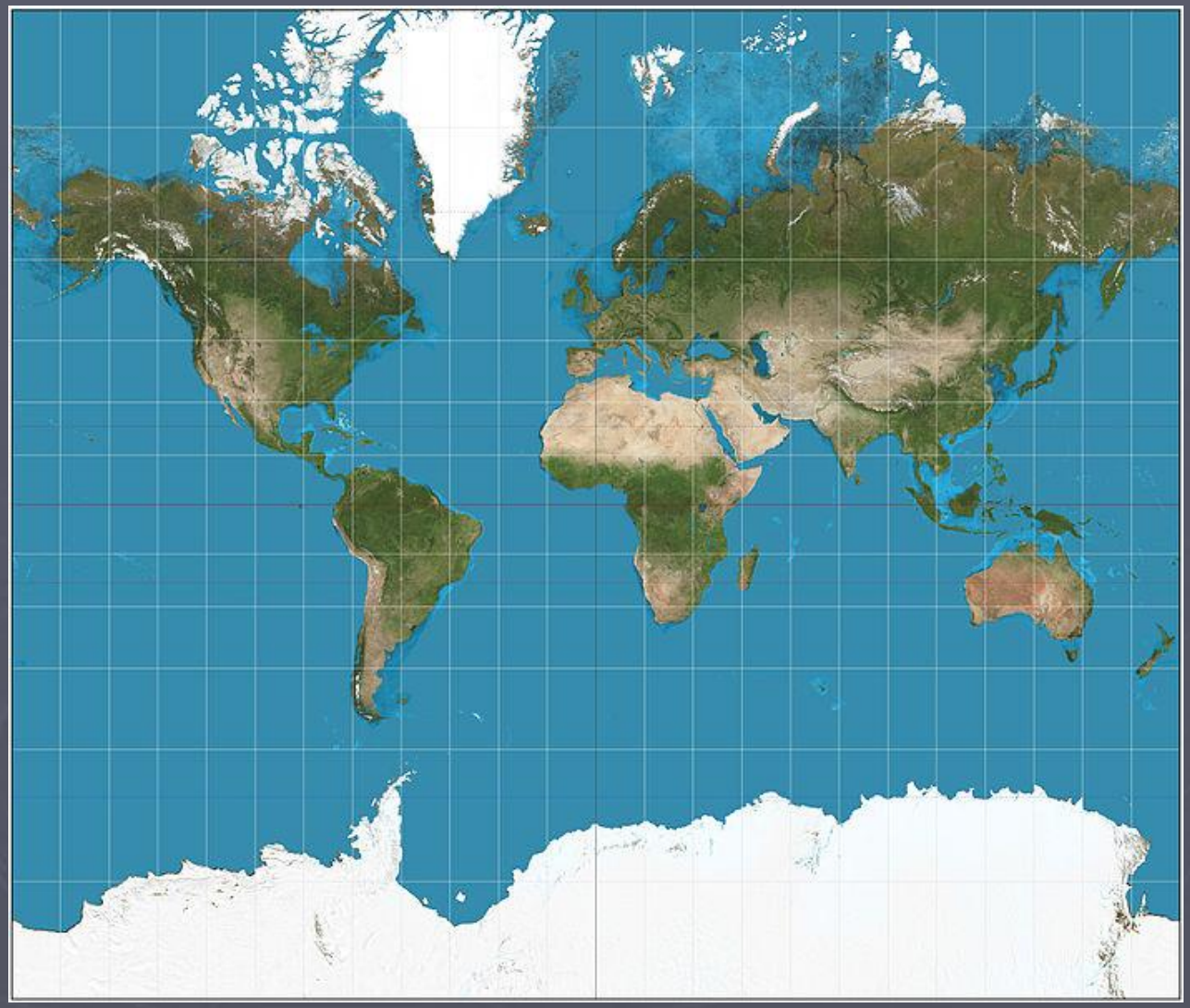
- A projection is a way of displaying the Earth's surface
  - The problem is the Earth is round and does not easily transfer to flat maps
  - Different projections are used to display different information, or even display power



Distortions and Scale

- No flat map is a perfect representation of the Earth's surface because of distortion and because they can not show each detail
  - **Distortion** - Certain areas are stretched out, or their shapes are changed
  - Scale – The relationship between the size of the map and the actual size of the area being shown

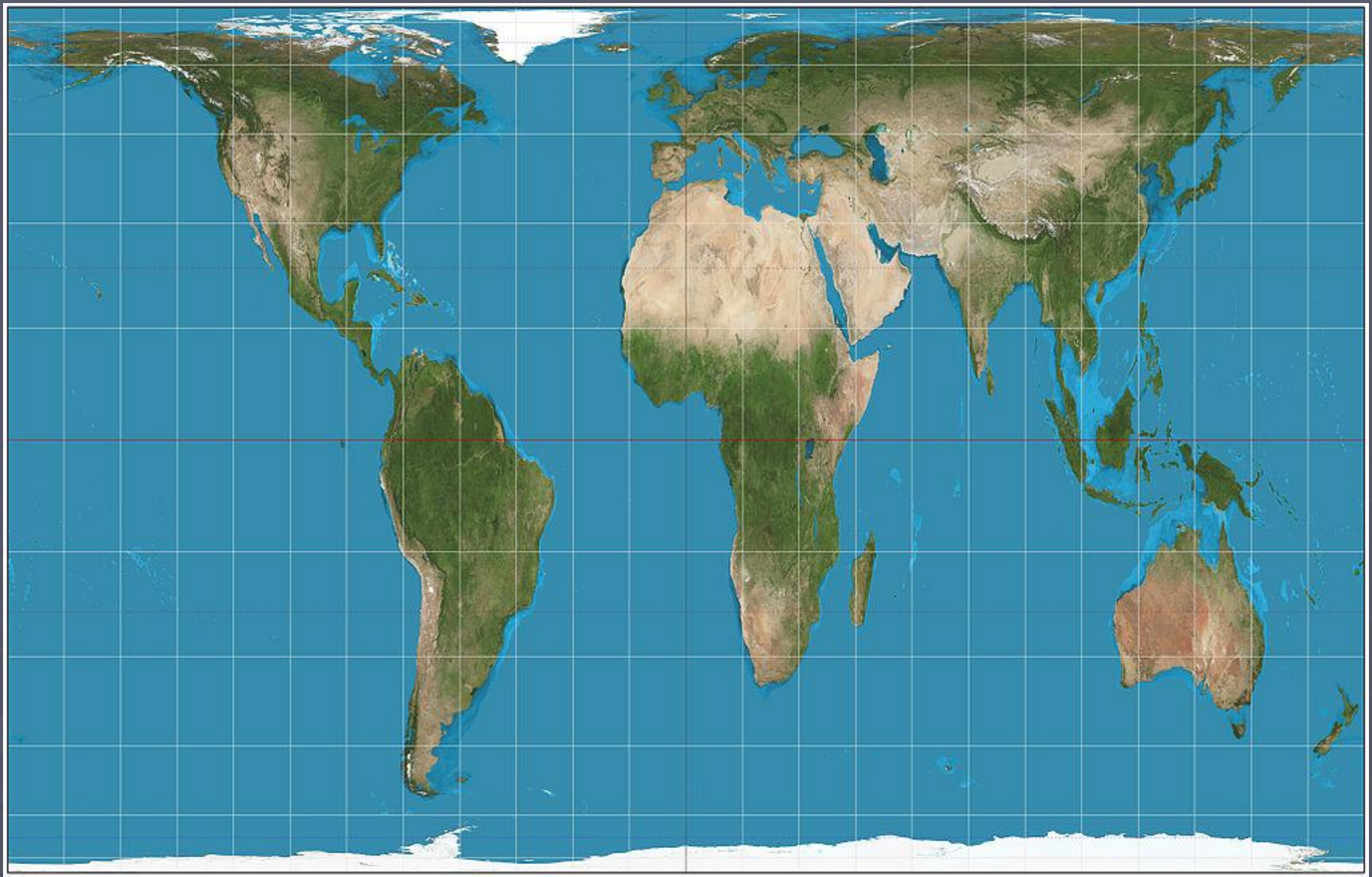
Mercator Projection



The Mercator Projection

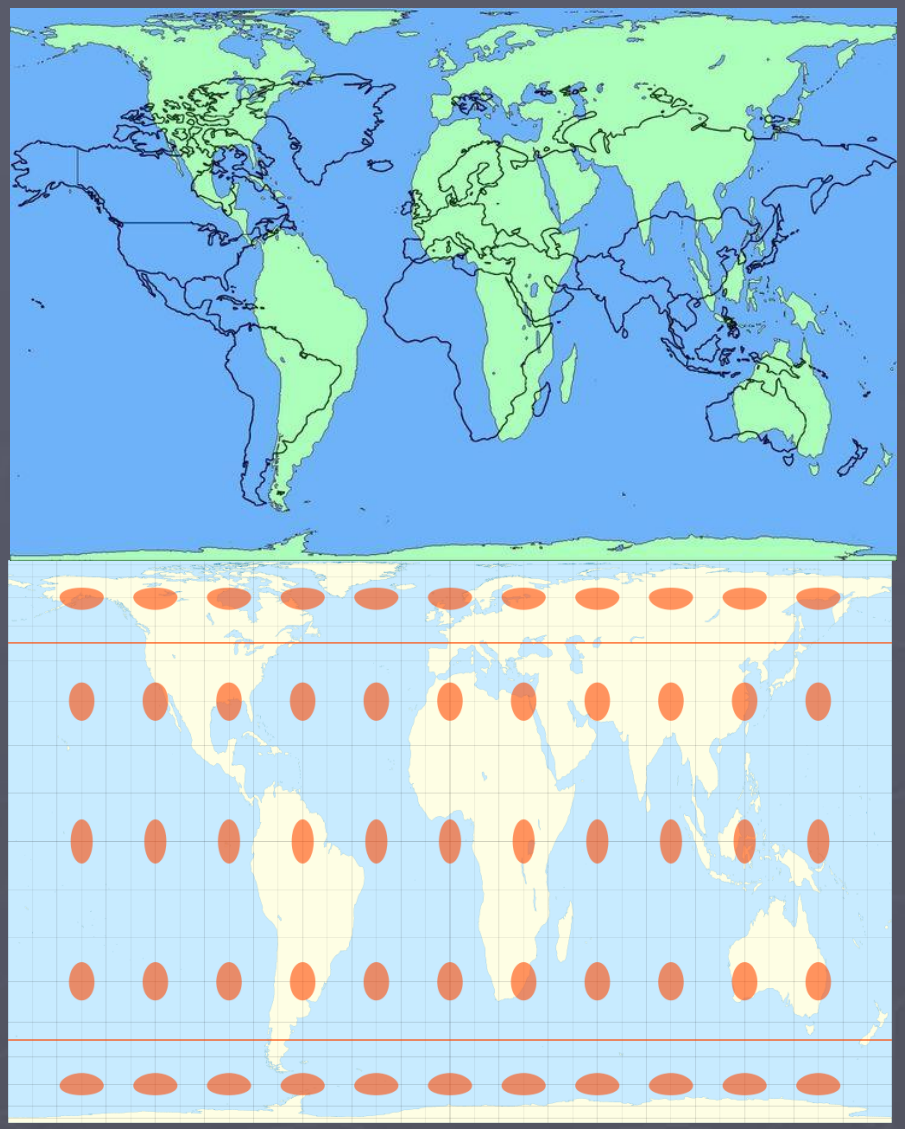
- Conformal Projection – Preserves angles and direction
- Created in 1569 by Gerardus Mercator
- Used for Navigation
  - Shows direction in straight compass bearings
  - Easy to see what is directly across from something else
- Distorted at North and South Pole
  - Makes Northern Hemisphere seem much bigger

Gall-Peters Projection

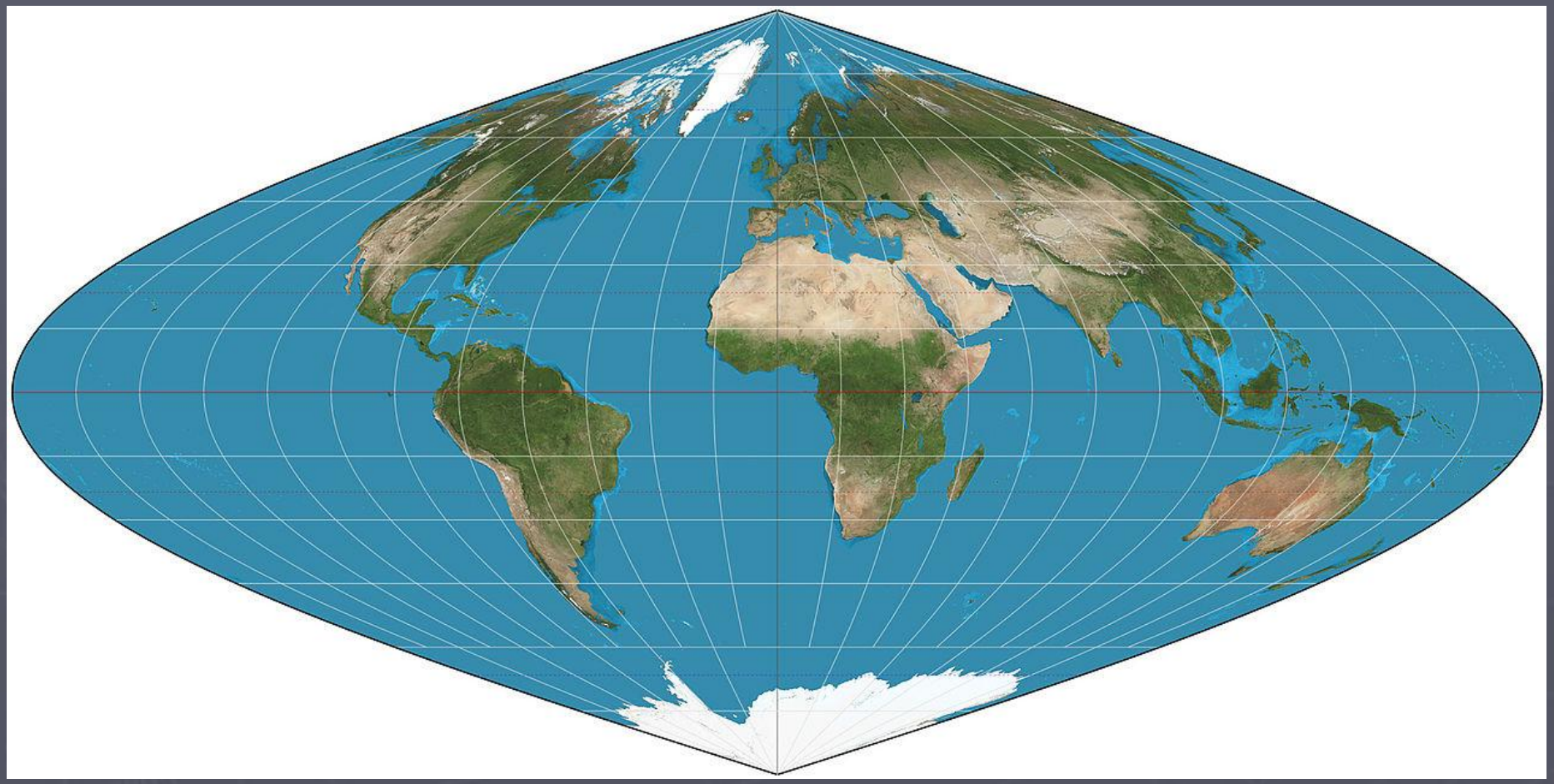


Gall-Peters Projection

- Equal Area Projection – Keeps size, but distorts shape
- Remade in 1967 by Arno Peters based off ideas of James Gall in 1855
- Attempts to more accurately display land size
  - Horizontal distortion near poles

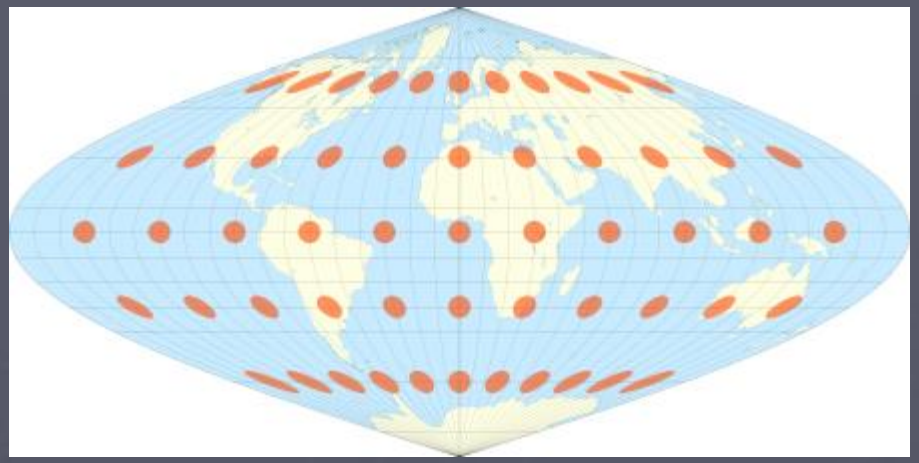


Sinusoidal Map Projection

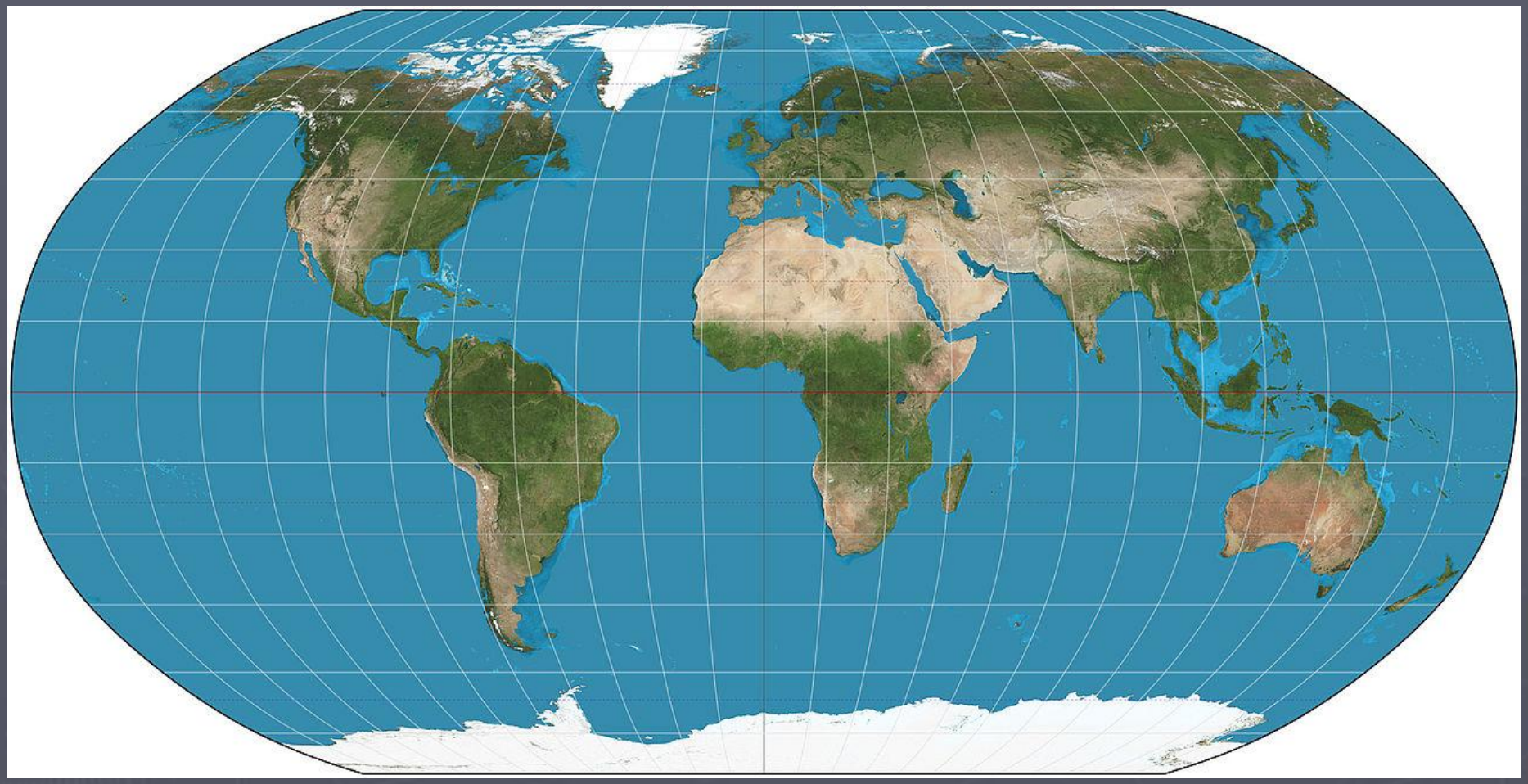


Sinusoidal Map Projection

- Equidistant Projection – Good for showing distance from some central location
- First created in 1570 by Jean Cossin
- Heavy distortion away from central point

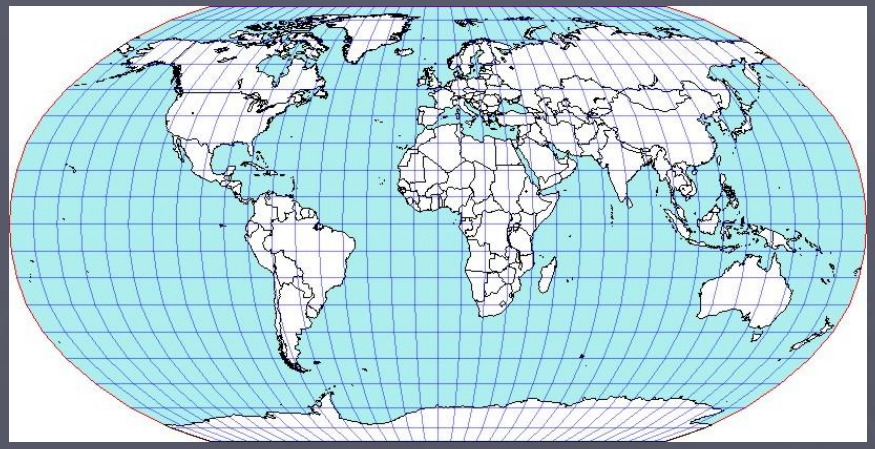


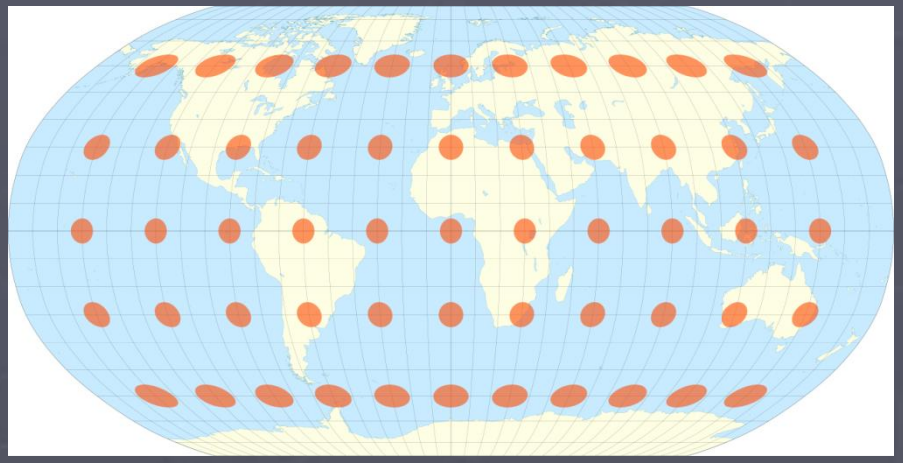
Robinson Map Projection



Robinson Projection

- Compromise Projection – A map that does not have equal area, conformal, or equidistant characteristics, instead tries to balance them all
- Created in 1963 by Arthur Robinson
- More accurately shows the area near the poles
  - Used to show proportions of land to water
  - Distorts cardinal directions and distance



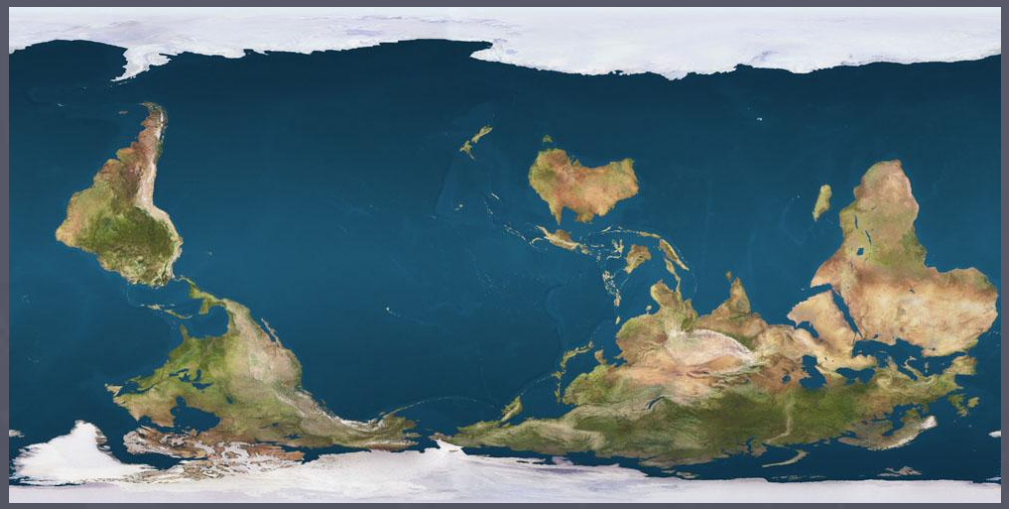


Other Notable Projections

Van der Grinten Projection

- Projects the Earth as a circle
- Extreme distortion as edges
- Created by Alphons J. van der Grinten in 1904

McArthur's Universal Corrective Map of the World



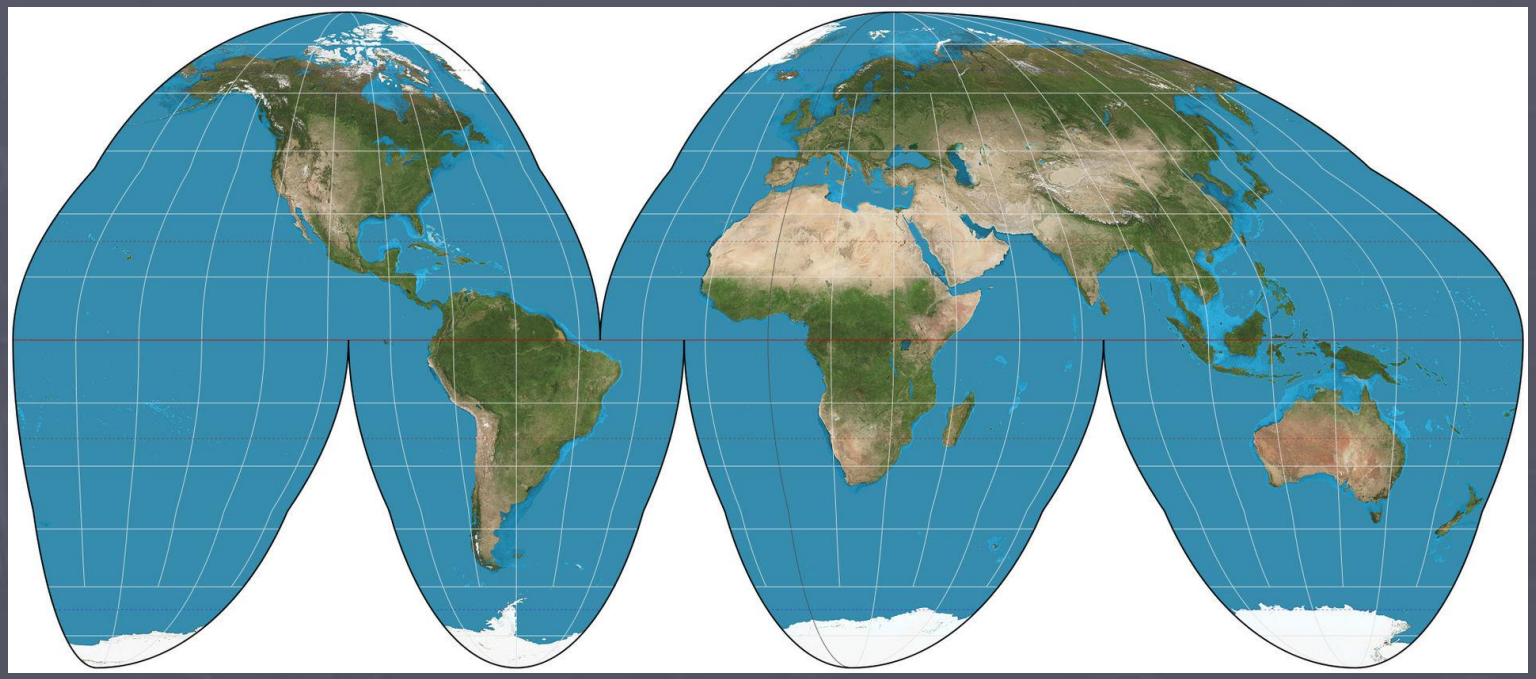
- Published in 1979 by Australian Stuart McArthur
- Challenged Eurocentric Maps
  - Flipped map so Australia and Southern Hemisphere now on Top
  - Rotated map so Australia was in the center of the map

Alber's Conic Projection

- Created by Johann Lambert in 1772
- Transfers map onto a rounded cone, and then spreads it out
  - Shows areas accurately but distorts shapes
  - Meridians are equally spaced

Goode Homolosine projection

- Created in 1923 by John Paul Goode to be an alternative to Mercator
- Preserves direction, but limits distortion



Winkel Tripel Projection

- Created by Oswald Winkel in 1921 to try to limit Area, Direction, and Distance distortion