Cartography

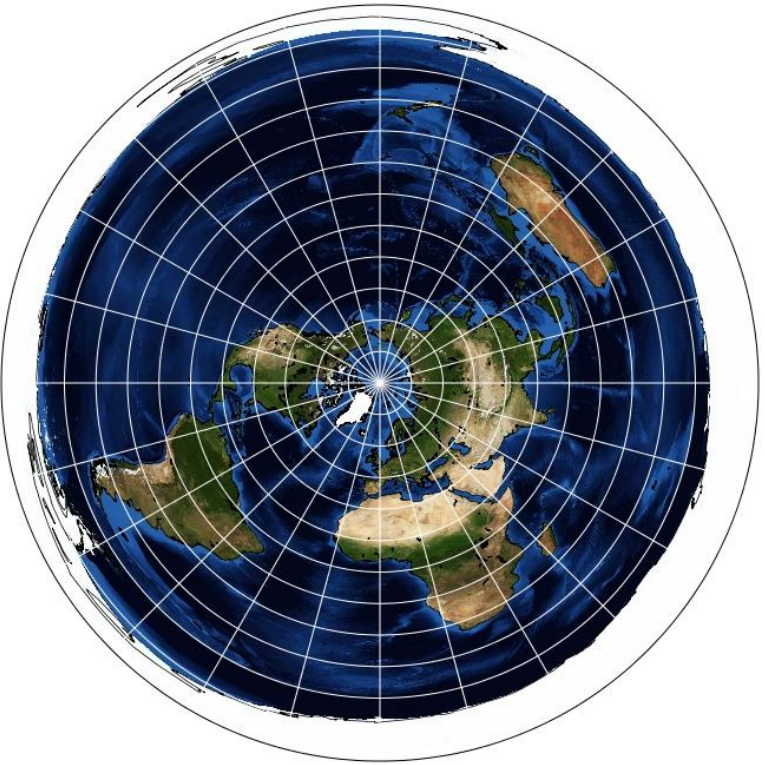
Doç. Dr. Erkan Yılmaz

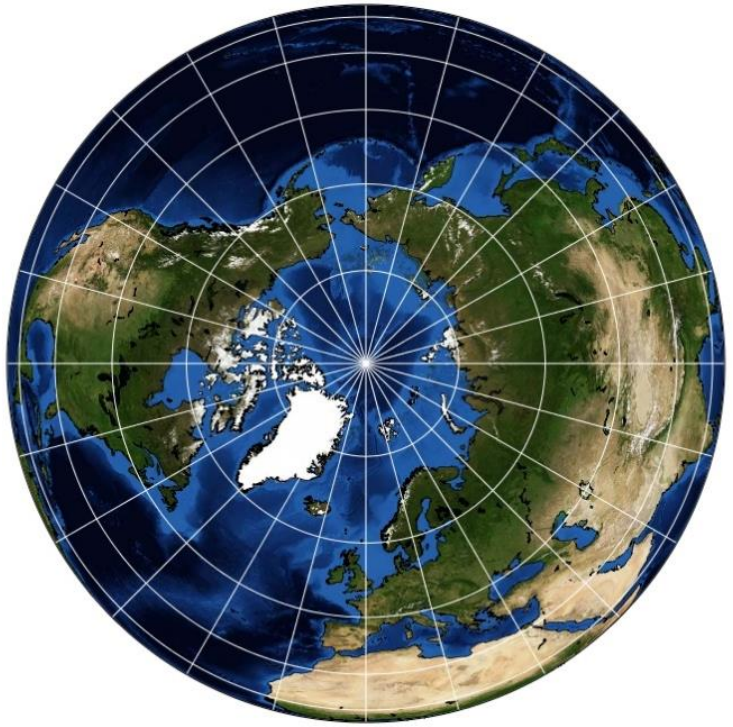
Calculating Parallel and Meridian Length

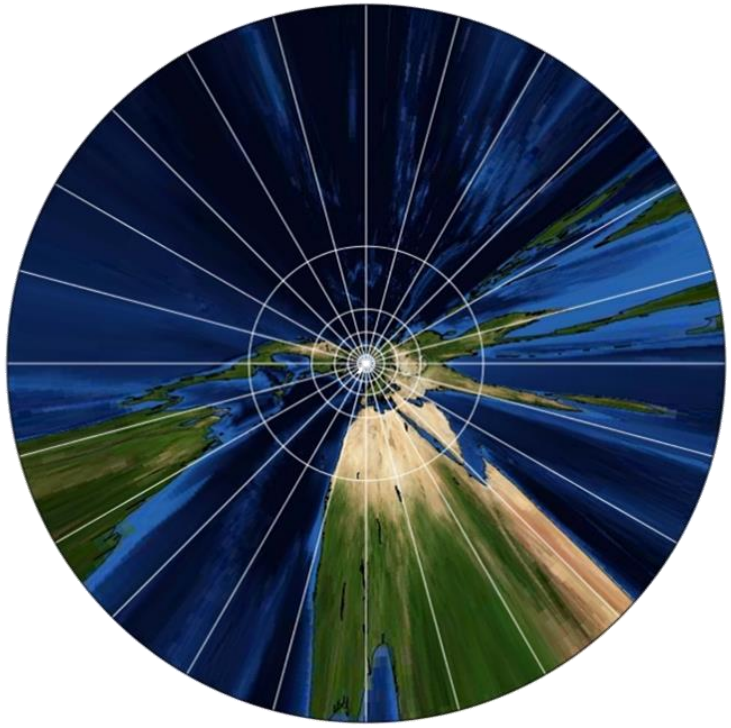
- **Pseudo Planer Projections**

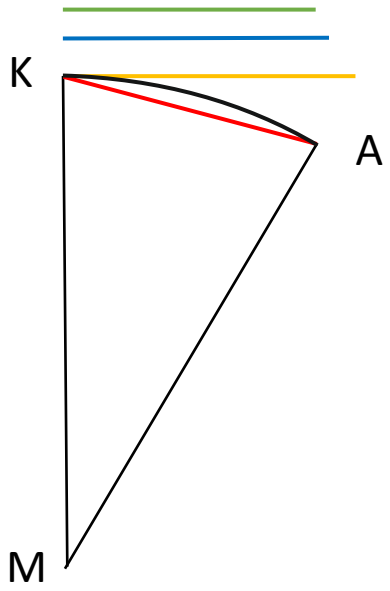
  Globular Projection

  Stabus-Werner Projection








K
A
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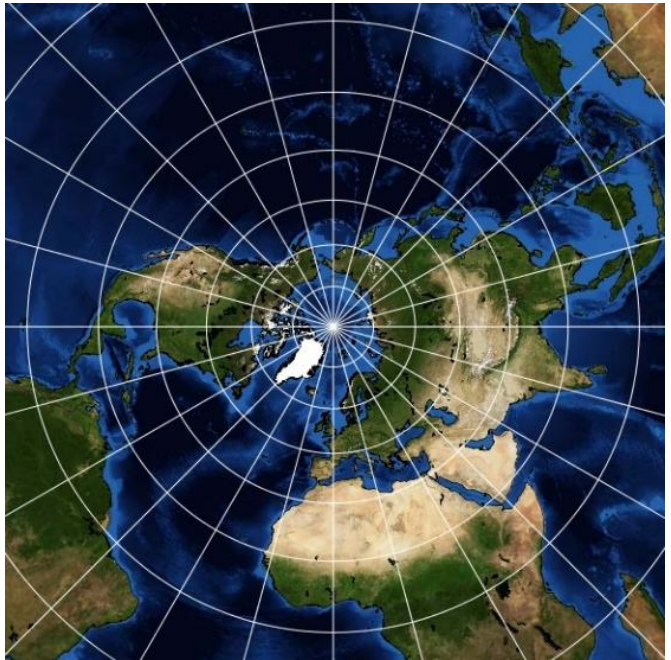
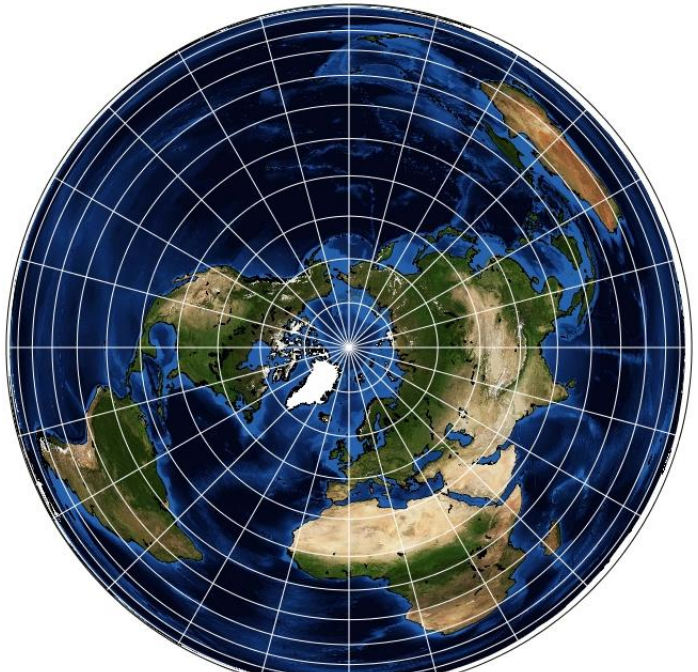
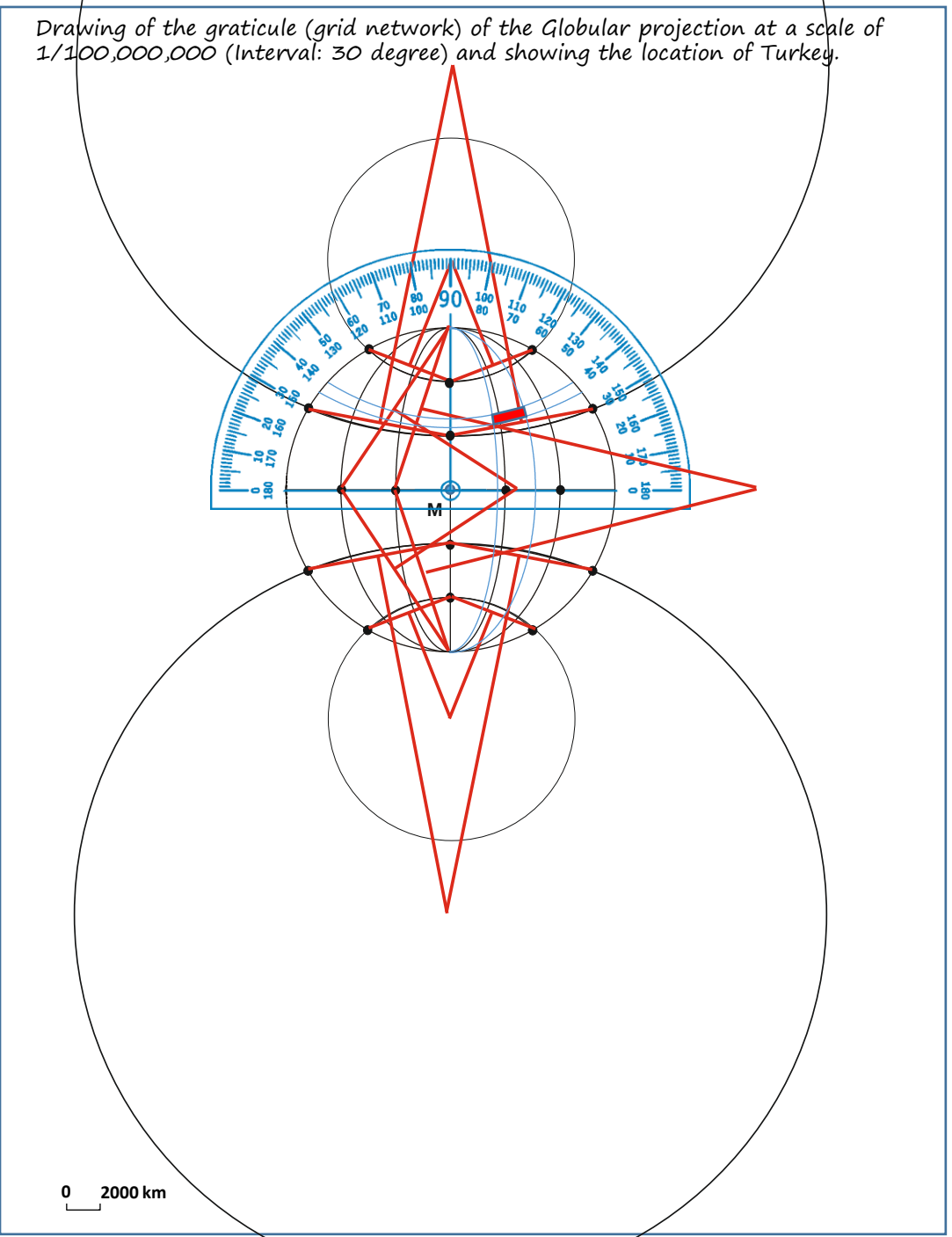




Globular Projection



Pseudo

Central Meridian

πR

$\pi R = 3,14 * 6,37 = 20$

Equator

$$\frac{2\pi R}{2} = \pi R$$

Al-Bīrūnī
Nicolosi Globular

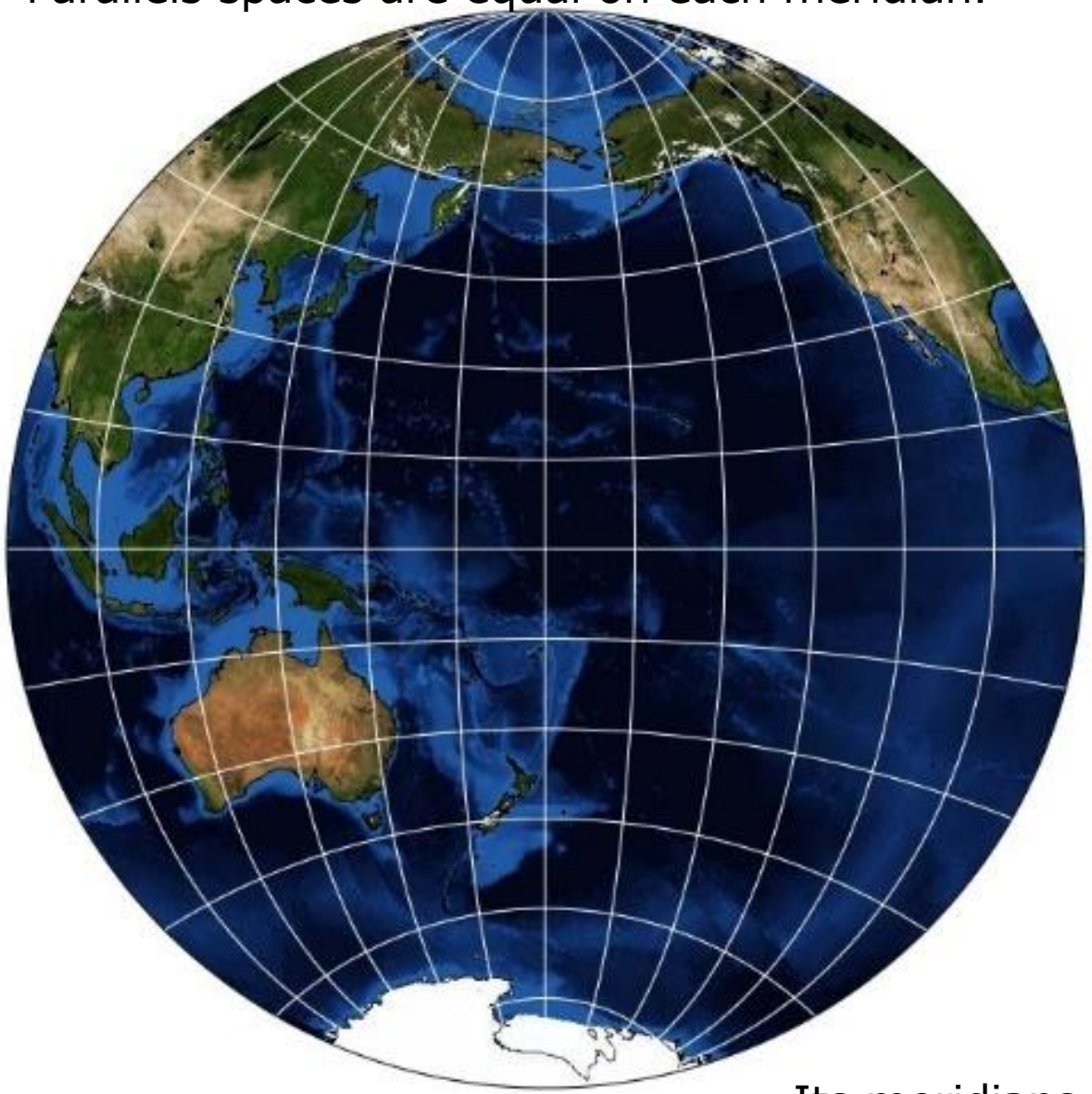
Logic

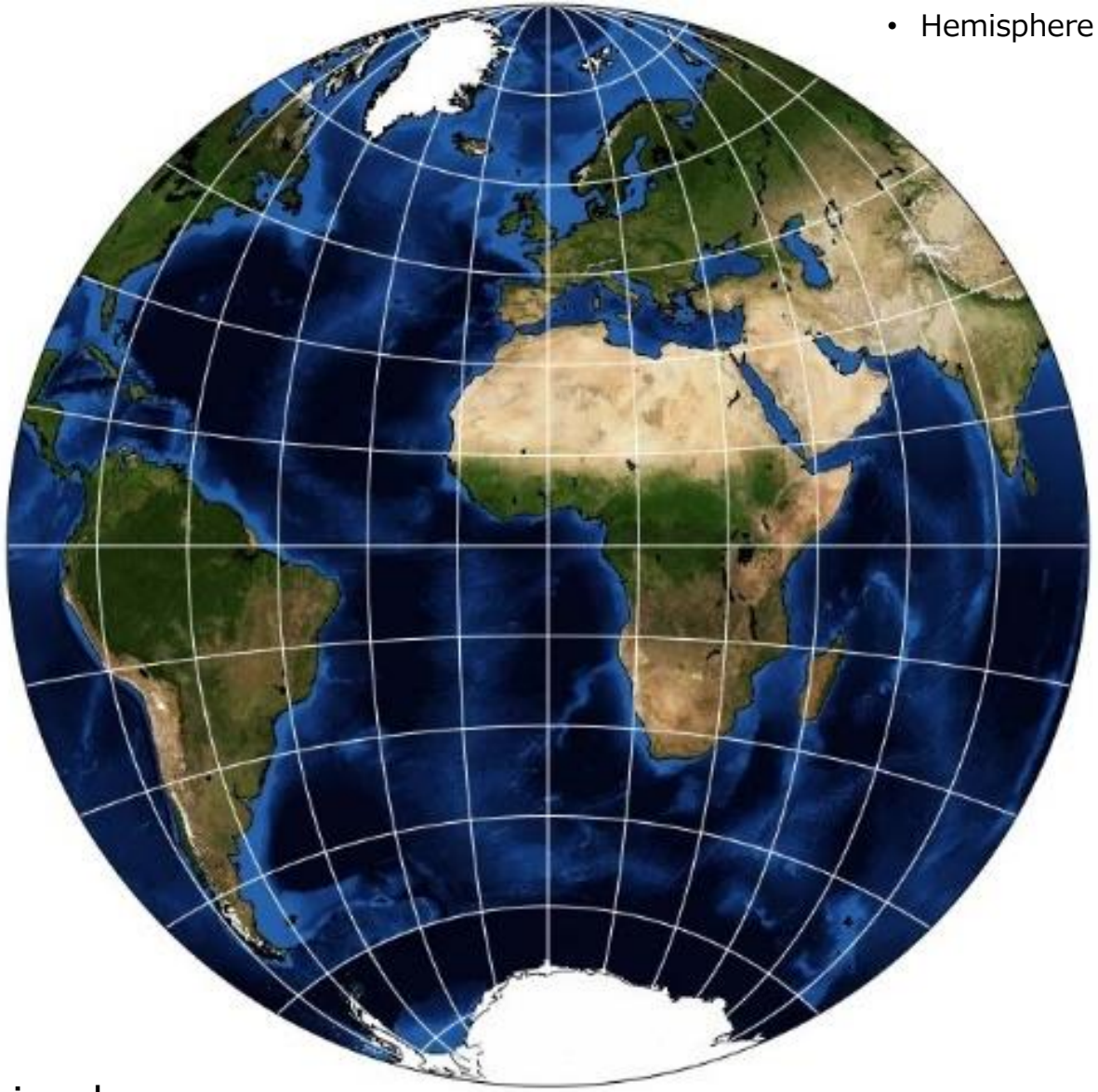
Maintaining length along the Central Meridian and the Equator

Features of Projection

- Half the world.
- Hemisphere

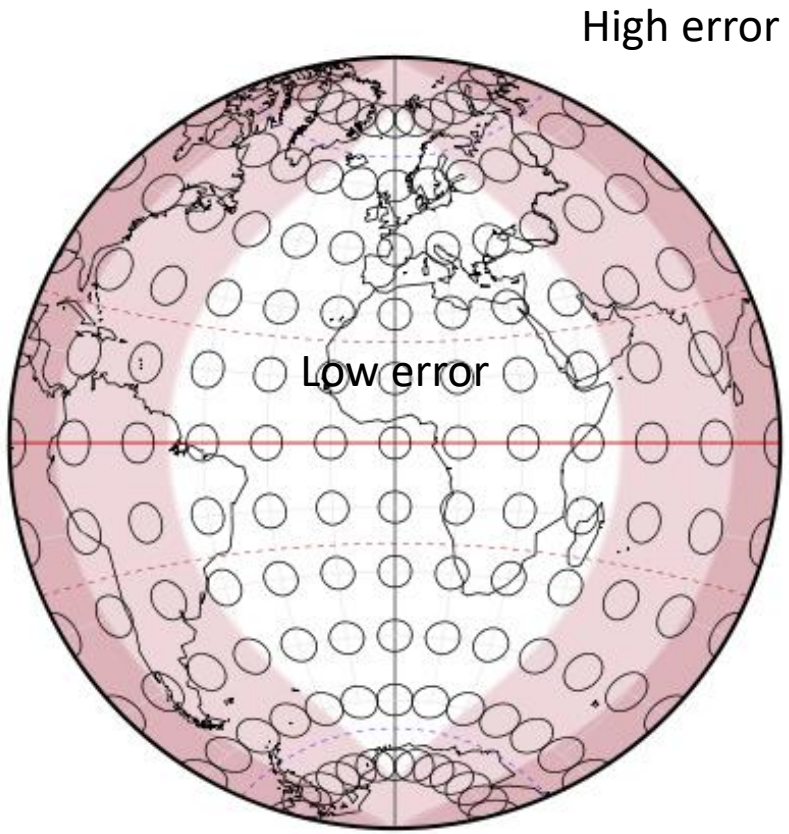
- Parallels are circular arcs.
- Parallels spaces are equal on each meridian.



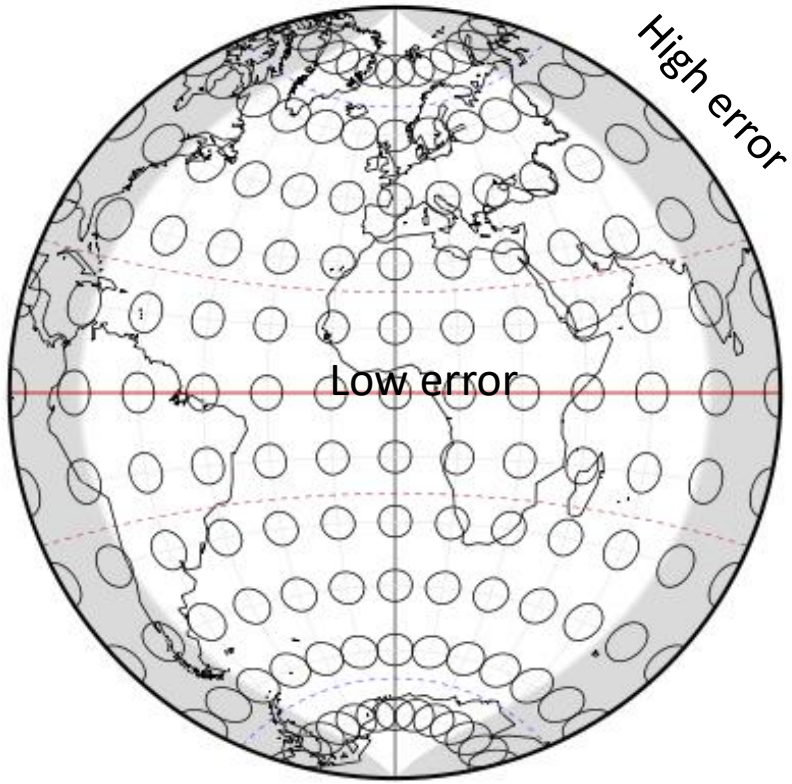


- Its meridians are circular arcs.
- Meridian spaces are equal on each parallel.

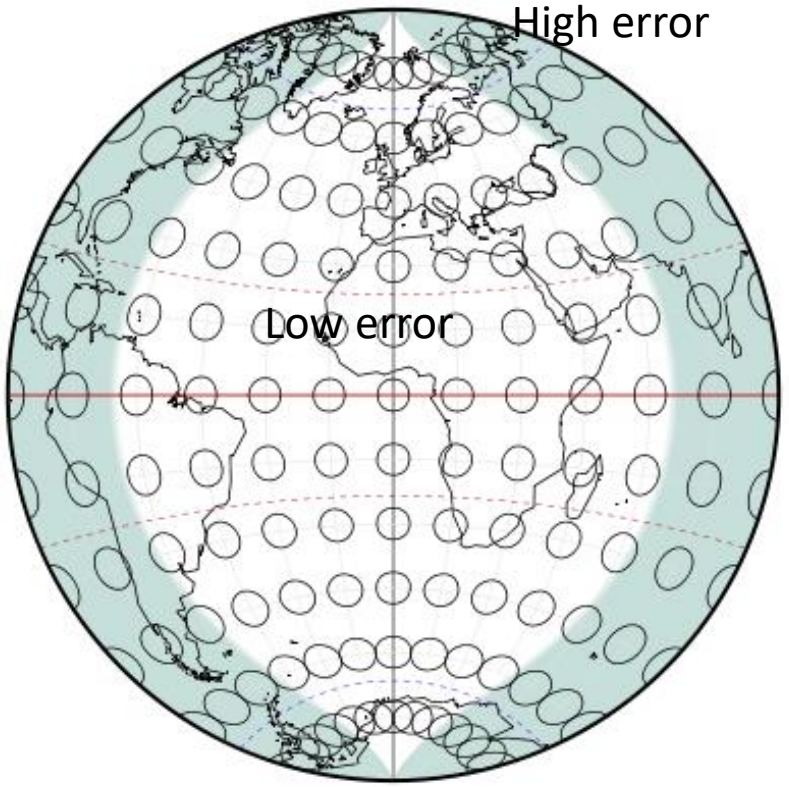
Distortions



Angle Distortion



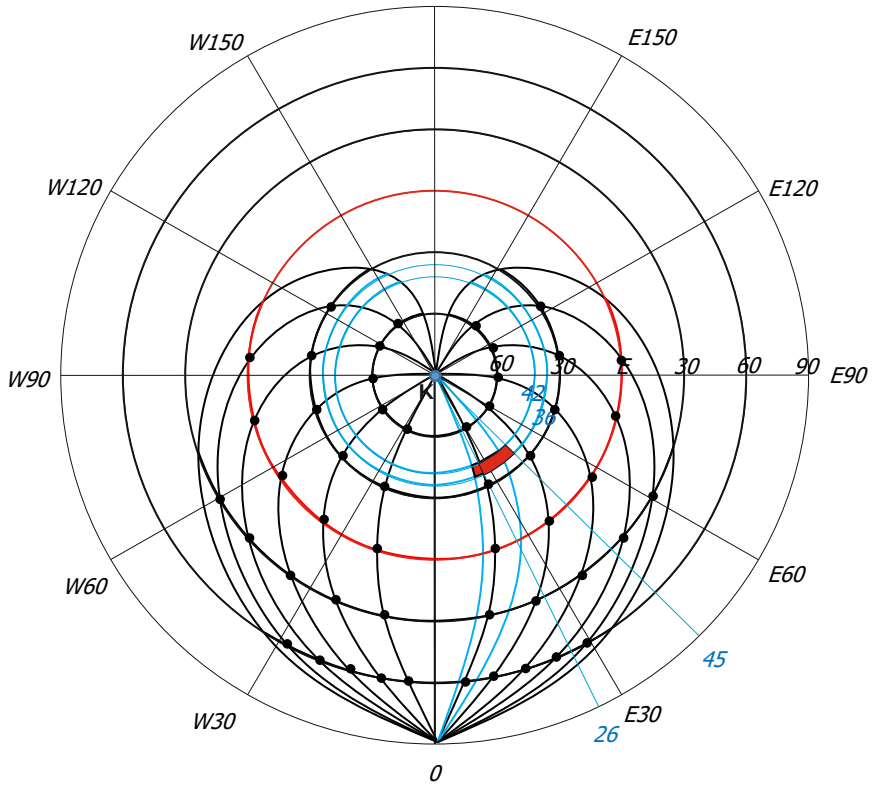
Distance Distortion



Area Distortion

Stabus-Werner Projection

Drawing of the graticule (grid network) of the Stabus-Werner projection at a scale of 1/100,000,000 (Interval: 30 degree) and showing the location of Turkey.



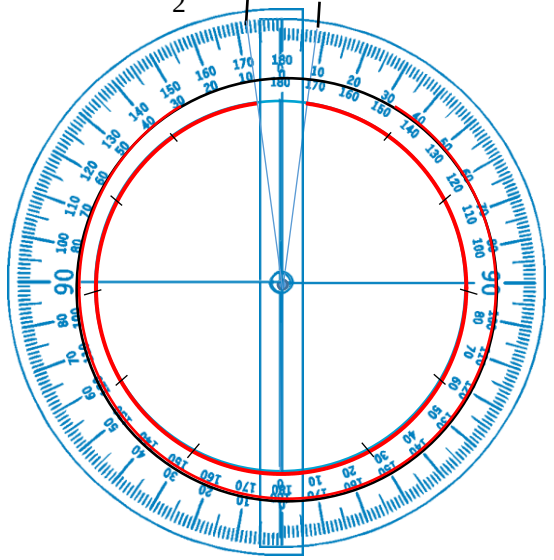
0 2000 km

$$NA' = \frac{2\pi R(90-\varphi)}{360} = \frac{2*3,14*6,37*30}{360} = 3,33$$

$$r_{N60} = \cos\varphi * R = 0,5*6,37 = 3,185$$

$$X = \frac{360*20}{20,91} = 344,32$$

$$\text{Angle} = \frac{344,32}{2} = 172,16$$

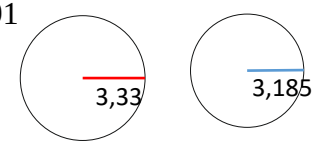


Logic

Maintaining length along parallels by editing Equidistant Projection.

$$2\pi r = 2*3,14*3,33 = 20,91$$

360º

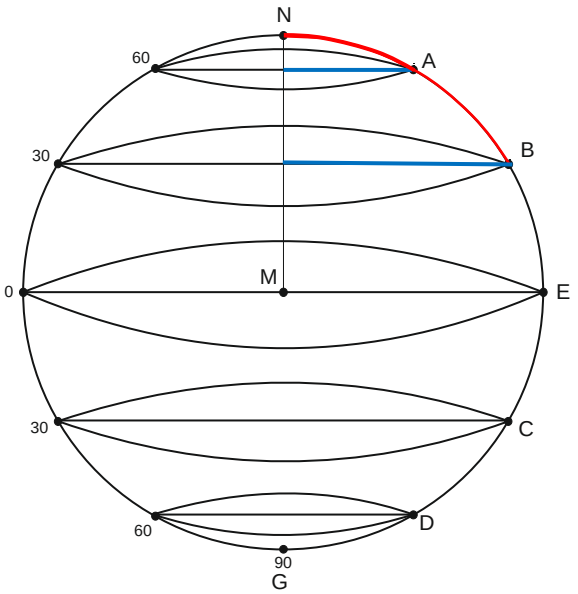


360 20,91

X 20

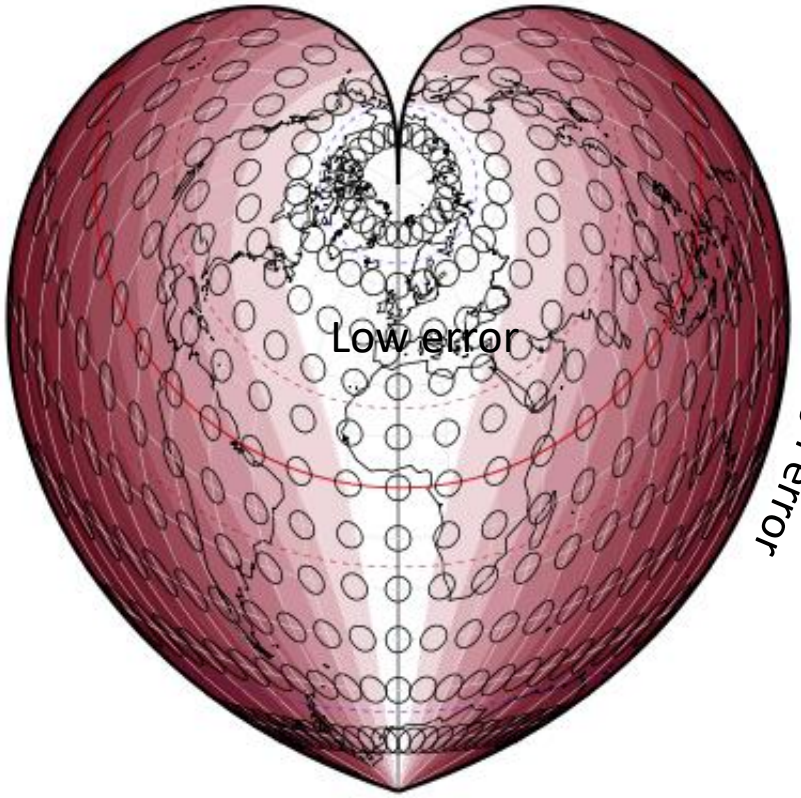
$$2\pi r = 2*3,14*3,185 = 20$$

	Radius of Equidi	C at Equ.	Angle	2	30 Angle	True C.	True Radiu
N60	3,33	20,91	344,32	172,16	28,69	20,00	3,185
N30	6,66	41,82	298,38	149,19	24,86	34,67	5,52
E	10	62,80	229,32	114,66	19,11	40,00	6,37
S30	13,33	83,71	149,08	74,54	12,42	34,67	5,52
S60	16,66	104,62	68,82	34,41	5,74	20,00	3,185
SP	20	125,60	0,00	0,00	0,00	0,00	0

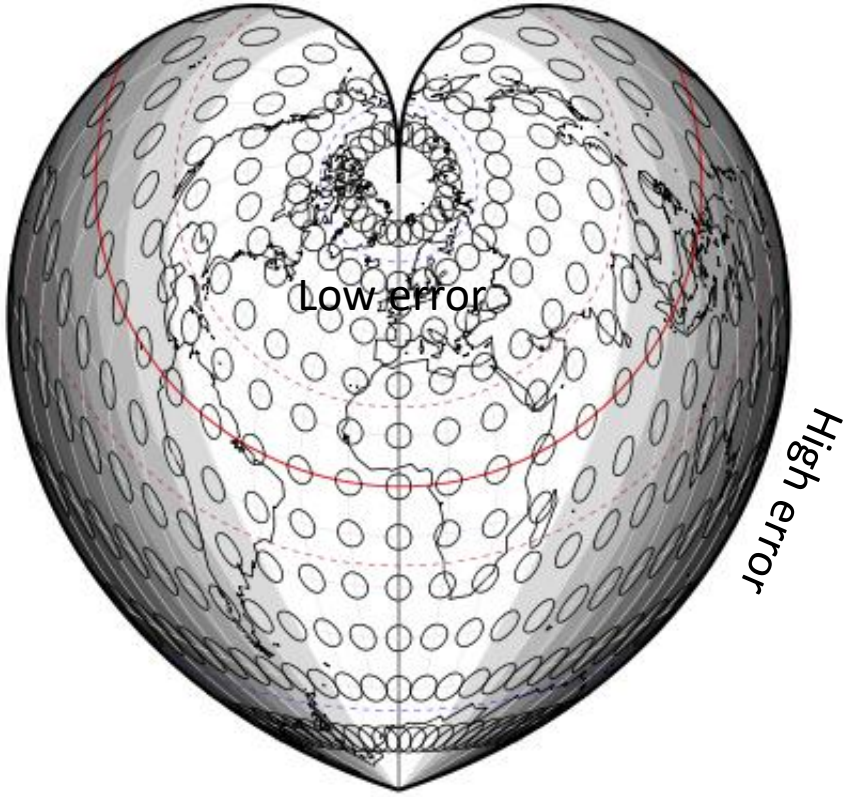


Lambert Azimuthal
Stobus-Werner

- **Equal area.**

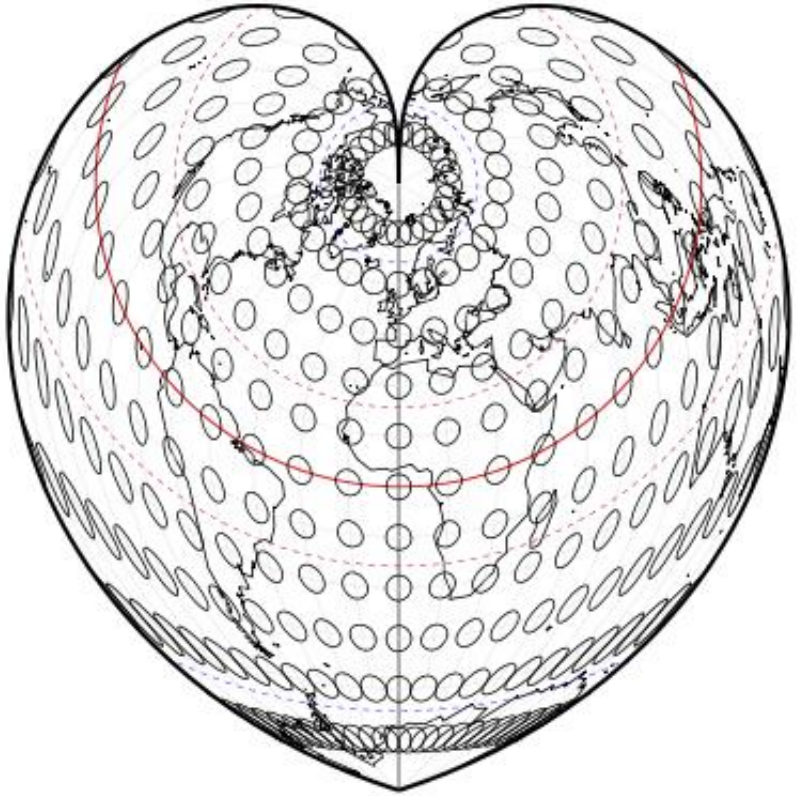


Angle Distortion



Distance Distortion

No Error

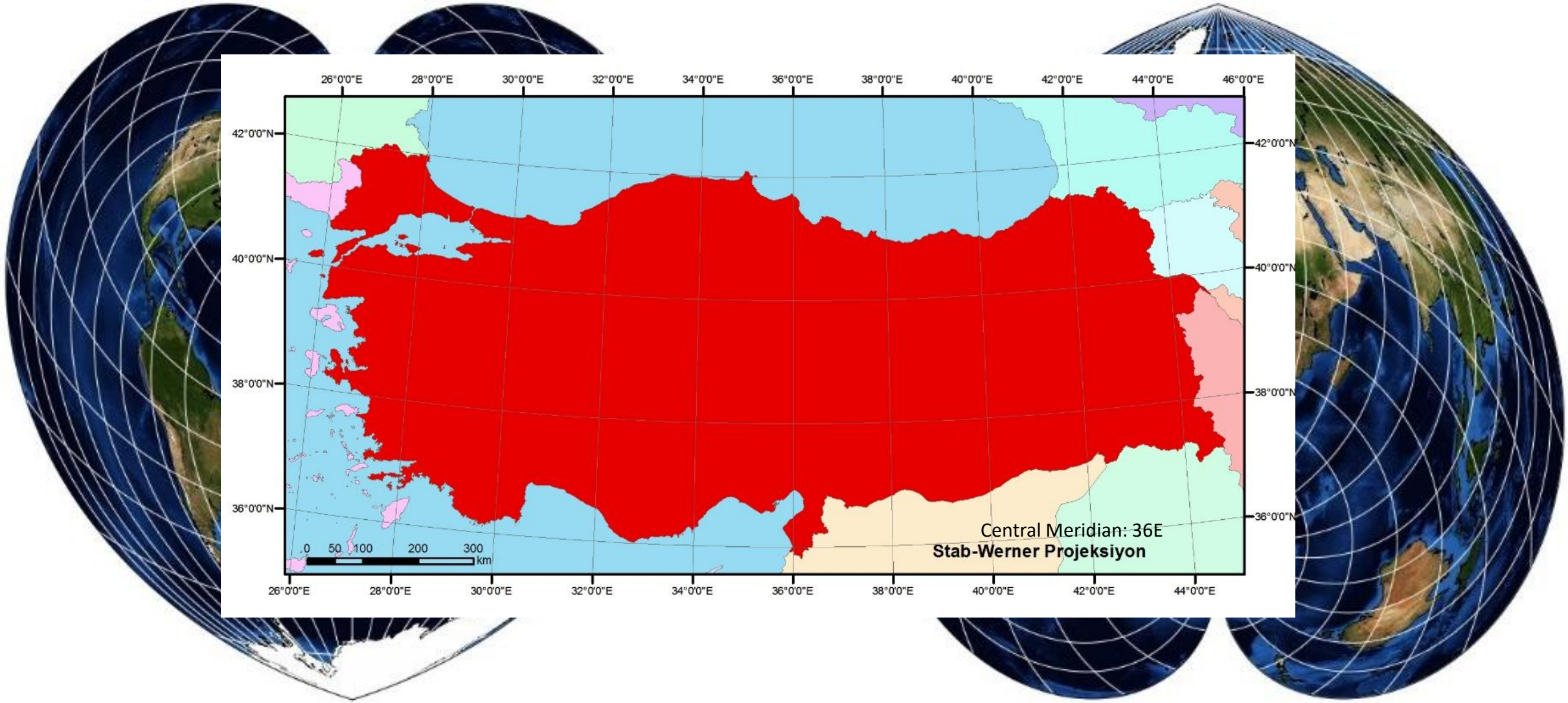


Area Distortion

GIS: Werner Projection

Features of Projection

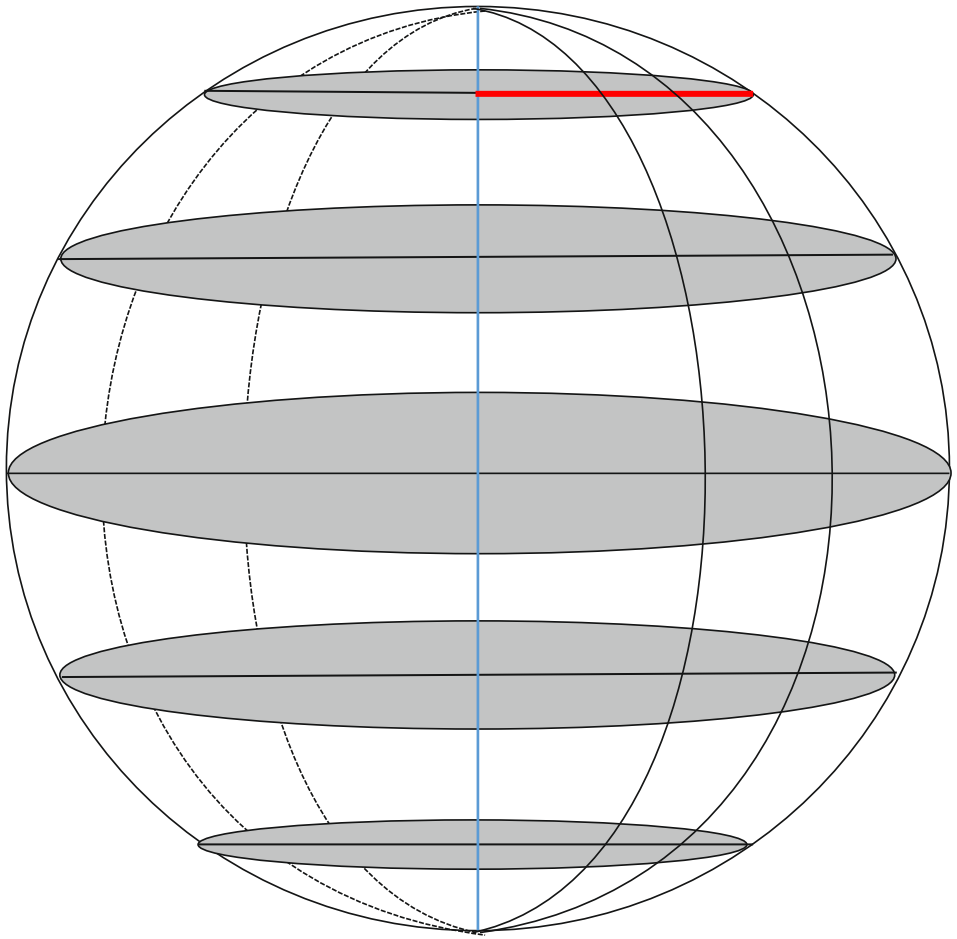
- Entire Earth



- The middle meridian is straight, the other meridians are in the form of elliptical arcs.

- Maintains length on the middle meridian and parallels.
- Parallels are circular arcs.
- Parallel spaces are equal.

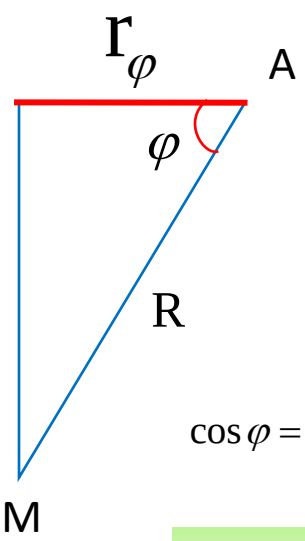
Calculating Parallel and Meridian Length



$2\pi R$

$$MU = \frac{2\pi R}{2} = \pi R$$

$$r_{60} = r_{\varphi}$$



$$\cos\varphi = \frac{adj}{hyp} = \frac{r_{\varphi}}{R}$$

$$r_{\varphi} = \cos\varphi * R$$