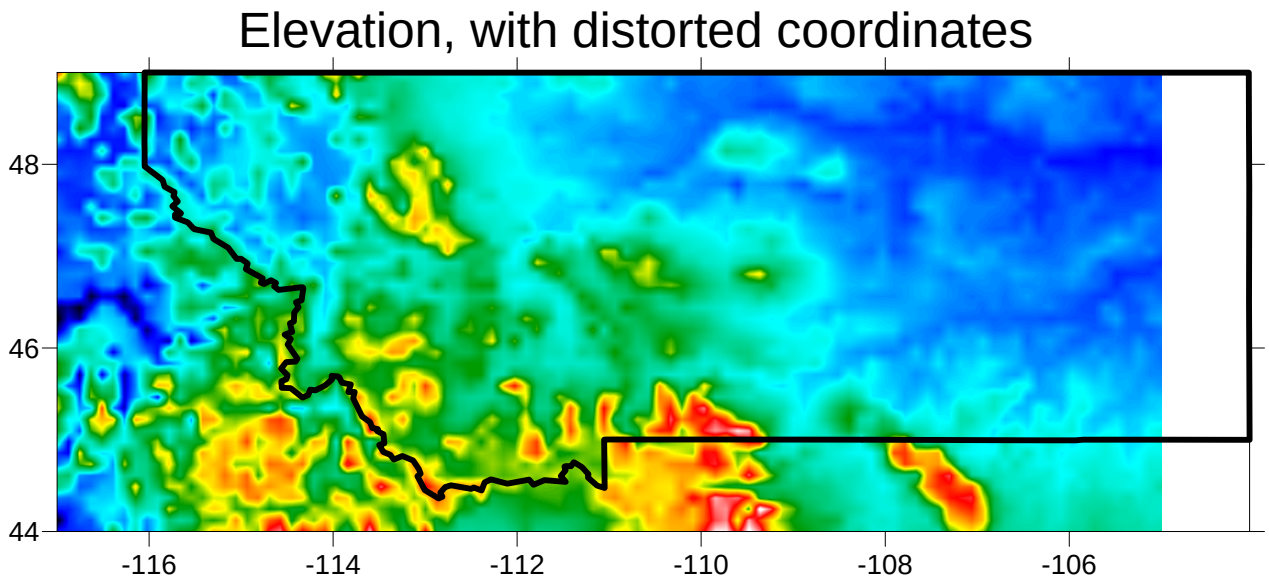
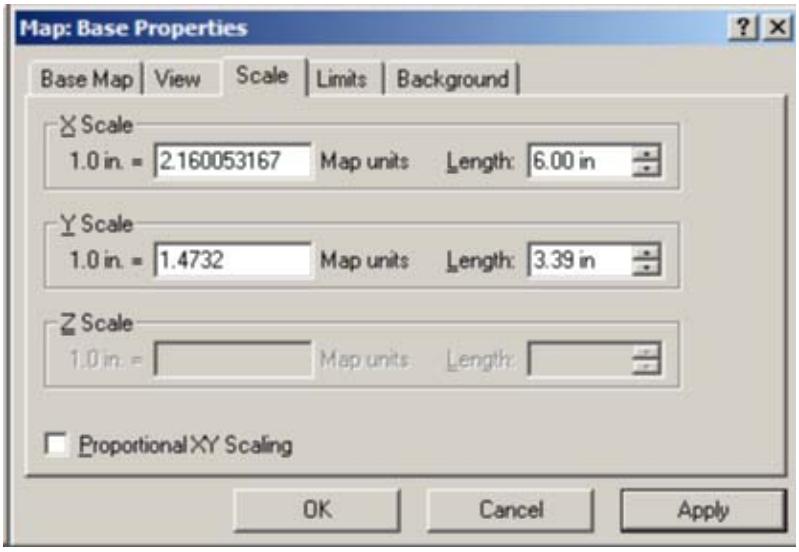
Correct the Scaling of Longitude, Latitude Coordinates in Surfer<C>

Surfer (version 8 and earlier) treats a degree of latitude equal to a degree of longitude. However, longitude's great circles converge from the equator to the poles. Thus, maps based on latitude, longitude are distorted unless you adjust the scale. Newton predicted Earth was flattened at the poles due to centrifugal acceleration competing with gravity. Newton's immediate successors measured Earth and confirmed that prediction[1]. If we ignore that detail and treat Earth as a sphere, we can fix Surfer's display of maps in longitude and latitude.

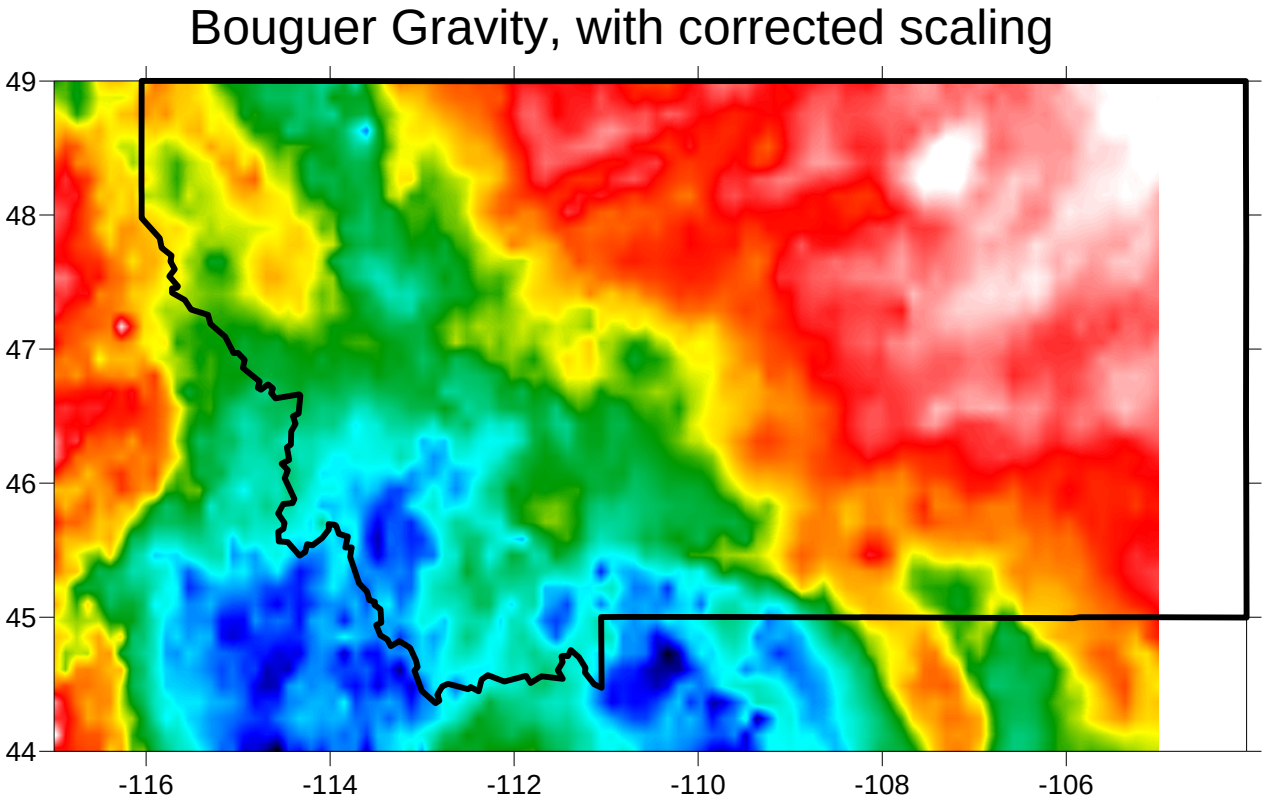


To determine the scaling factors:

- Calculate the cosine of the median latitude on the map
- Open the map properties
- Go to the Scale tab and turn off the Proportional Scaling check box
- Multiply the X Scale map units value by the cosine of the latitude, and enter this number into the Y Scale Map units field



- Click OK and the map is drawn with the new scaling.



[1] Weighing the World: The Quest to Measure the Earth, Edwin Danson, Oxford University Press, USA, 2009.