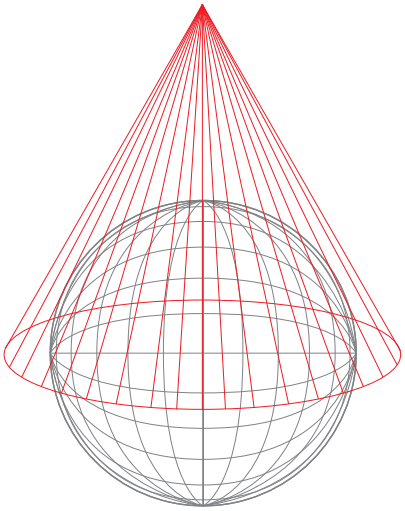
Map Projections 地图投影

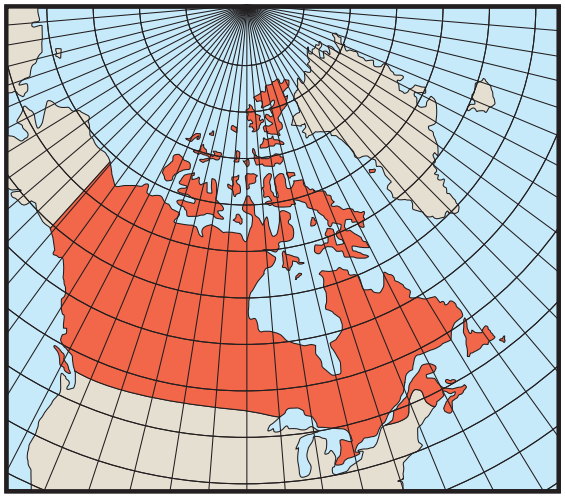
Types of Maps 地图类型

A spherical surface can not be represented on a flat surface with out some type of distortion. Distortions include the stretching of some details and the compression of others. Depending on the method used different distortions will occur. There are 3 main types of map projections used. Conic, Mercator, and Equivalent map projections.

一个球形的表面只有经过一些变形才能在一个平面上展开。这里的变形包括一些伸展和一些收缩。不同的方式会出现不同的变形。有三种类型的地图投影方式：圆锥投影法、圆柱投影法和等效图法。

Conic Map Projection 圆锥投影法



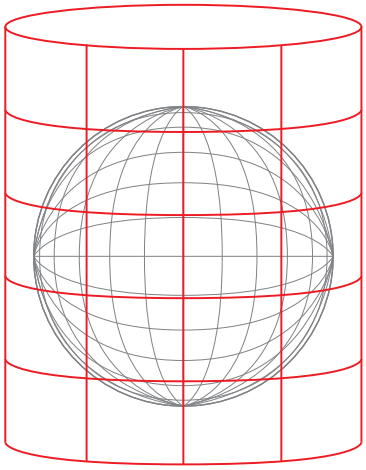


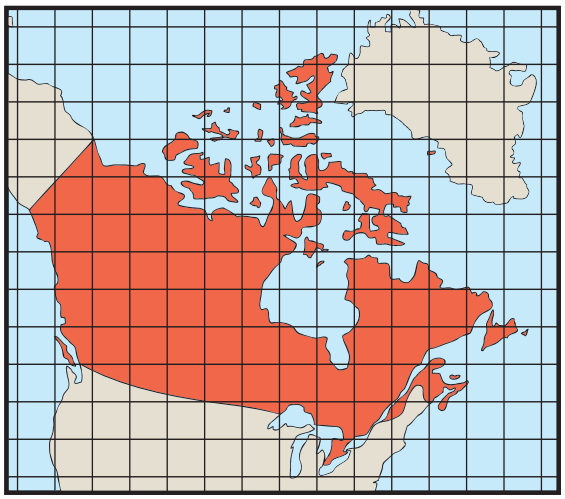
A type of map projection that shows a section of the globe. Information is transferred onto a flat surface based on the distortion that would occur if a globe was projected onto a cone. Land masses near the tip of the cone get compressed, while land masses near the base get stretched. In the example of the Canadian map the island of Greenland becomes smaller while America becomes larger.

圆锥投影法显示的是一个球面的一部分。 球面在圆锥的投射下然后经过变形扭曲把信息转换到一个平面上。那么，靠近圆锥顶端的信息部分就会被压缩，而靠近圆锥末端的部分就会被伸展。在以上加拿大地图中，格陵兰岛就变得非常小，而美国变得很大。

Map Projections 地图投影

Mercator / Cylindrical Map Projection 墨卡托/圆柱投影法



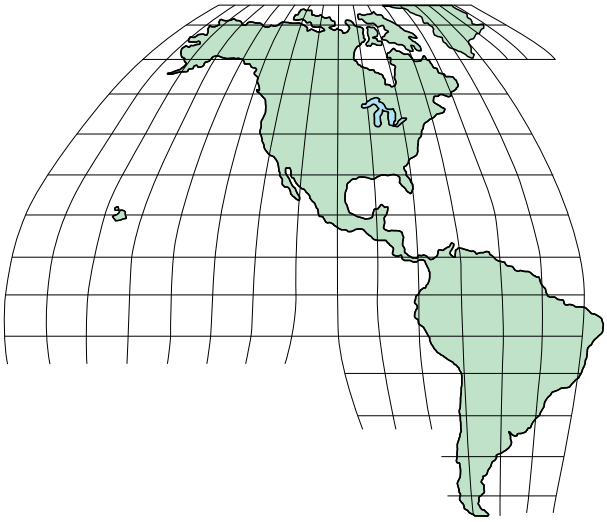


Mercator was a Flemish geographer who invented a cylindrical system of map projection that is named after himself. The map projection is based on the distortion that would occur if the globe is projected onto the surface of a cylinder. Central land masses near the equator do not get distorted, however land masses near the North and South Poles get enlarged significantly. In the example the island of Greenland is distorted and appears to be half the size of Canada. In reality the actual land mass of Greenland would fit into Canada almost five times.

墨卡托是一名佛兰德地理学家，他发明了一种圆柱形的地图投影法并以他自己名字命名。圆柱投影法是根据球面在圆柱体的投射下然后经过变形显示出来的，所以靠近南北两极的地面就会被放大很多。如上图格林兰岛就被变得非常大，差不多有半个加拿大那么大，但实际上加拿大要比格林兰岛大5倍。

Map Projections 地图投影

Equivalent Map Projection 等效图法

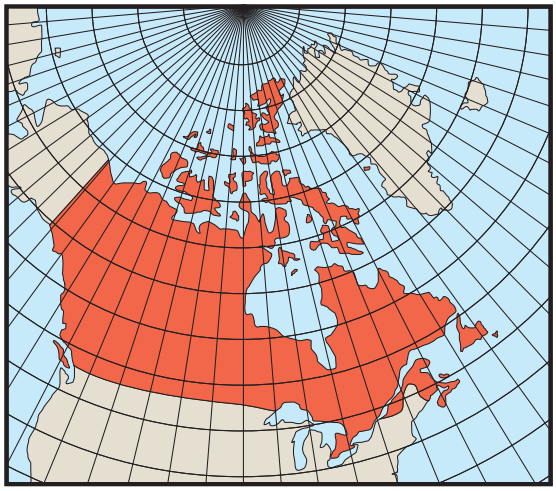


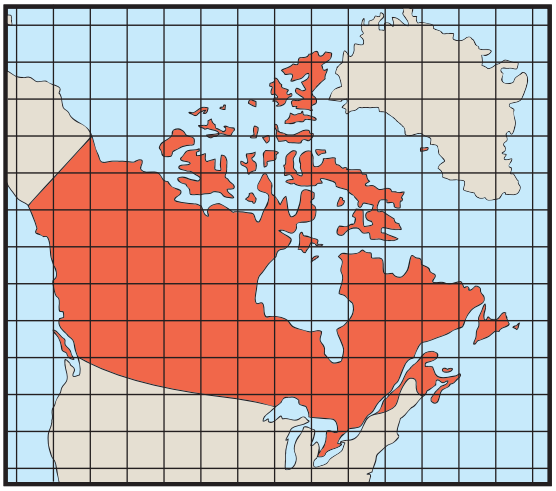
Equivalent maps are based on distorting the grid used to measure land masses so that an accurate representation of the land masses can be shown. You will notice that the grid lines are not parallel and will change direction. The grid distortions are based on how lines of a sphere would look if you pealed the surface of a globe and flattened out the skin just like pealing an orange. Some tears would have to be made in the skin of the orange, or sphere, to allow you lay the skin flat. These tears in the sphere of the skin result in a change of direction of the various reference lines for latitude and longitude.

等效图是基于网格的变形来展示相对较为准确的地图。你会发现在等效图中网格的线条不再是平行的了，方向也会有所变化。网格的变形就相当于你把地球仪的表面给削下来然后平放起来，就像你剥桔子皮一样，然后把剥下来的表面平摊放置，这样就会出现那些原本是直线的纬线和经线却放生了扭曲变化。

Map Projections 地图投影

Identifying Different Map Projections 识别不同的地图投影法





Look at the difference between these two maps. Can you tell the difference?
看上面两幅图，你能发现有什么不同吗?

The map on the left is a _____ Map. Can you describe how the map on the left gets distorted?
左图是_____地图。 你能描述一下该图是怎样扭曲变化的吗?

_____

_____

_____

_____

The map on the right is a _____ Map. Can you describe how the map on the right gets distorted?
右图是_____地图。 你能描述一下该图是怎样扭曲变化的吗?

_____

_____

_____

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