

2. PROJECTION SYSTEMS - D) COMMONLY USED MAP PROJECTIONS

<previous - next>

The table below gives an overview of some commonly used projection systems, with an annotation that discusses their properties, as relevant for specific uses of these maps. The projections are categorized according to projection plane.

Projection	Remarks
Cylindrical	
Central cylindrical	Map is perspective but not conformal nor equal area. Projected perspective from the center of the earth onto a cylinder tangent to the equator. Only used for teaching purposes.
Equidistant cylindrical	Also called Simple Cylindrical or Plate Carree. Used for raster maps which store information of the whole world: Each pixel represents a square block of LatLon coordinates, i.e. information is stored per degree, per minute, etc. Used for mapping the earth taken as a sphere.
EquiRectangular	Also called Plate Rectangle. Variant of Plate Carree. Used for raster maps which store information of the whole world: Each pixel represents a rectangular block of LatLong coordinates.
Mercator	Conformal. Designed for navigational use; standard for marine charts. Recommended use for conformal mapping of regions predominantly bordering the equator. Often inappropriately used as a world map.
Trasverse Mercator	Also called Gauss Conformal, or Gauss Krüger. Transverse form of the Mercator Projection (conformal). Used for many topographic maps at scales from 1: 20000 to 1: 250000. Recommended for mapping regions that are predominantly north-south in extent.
UTM	Universal Transverse Mercator. Map is conformal. Widely used for topographic maps and military maps.
Lambert Cylindrical Equal Area	Lambert Cylindrical Equal Area. Mainly used for educational purposes.
Mollweide	Pseudo-cylindrical projection. Map is equal area. Occasionally used in thematic world maps.
Azimuthal	
Lambert Azimuthal Equal Area	Lambert Azimuthal Equal Area. Used for maps of continents and hemispheres. Also suited for regions extending equally in all directions from a center point, such as Asia and the Pacific Ocean.
Azimuthal Equidistant	Azimuthal Equidistant. Commonly used in the polar aspect for maps of polar regions and the Northern and Southern hemispheres. The oblique aspect is frequently used for world maps centered on important cities and occasionally for maps of continents.
Orthographic	Known by Egyptians and Greeks 2000 years ago. Map is perspective and neither conformal nor equal area. Only one hemisphere can be shown. The earth appears as it would on a photograph from space.
Stereographic	Apparently invented by Hipparchus (2nd century BC). Used in combination with UTM projection as Universal Polar Stereographic (UPS) for mapping poles and in navigation charts for latitudes above 80°. Recommended for conformal mapping of regions that are approximately circular in shape. For example, used for topographic maps of the Netherlands.
Gnomonic	Map is perspective and neither conformal nor equal area. It is used to show great circle paths as straight lines and thus to assist navigators and aviators.
Conical	
Albers Equal Area Conic	If the pole is one of the standard parallels, it is equal to Lambert's Equal Area Conic. Frequently used for maps of the United States, for thematic maps and for world atlases. Recommended for equal area maps of regions that are mainly east-west in extent.
Lambert Conformal Conical	Lambert Conformal Conic/Conical Orthomorphic (Lambert, 1972) (conformal). Extensively used for large-scale mapping of regions predominantly east-west in extent. Further widely used for topographic maps.
Equidistant Conic	Also called Simple Conic. The most common projection in atlases for small countries.
Polyconic	or American Polyconic (Hassler, ± 1820). Map is neither conformal nor equal area. The sole projection used for large scale mapping of the United States by the USGS until the 1950's.

Source: [Geometric aspects of mapping](#), ITC
(Click [here](#) for enlargement)

For more detailed information on projections see [Chapter 4](#) of "[Geometric aspects of mapping](#)".

<previous - next>

Home
|
[Self study](#)
:
[Reference systems](#)
|
[Contents](#)
|
[Intro](#)
|
[1. Graticule / topographic grid](#)
|
[2. Projection Systems \(a/b/c/d\)](#)
|
[3. Plane rectangular coordinate systems \(a/b\)](#)
|
[4. Coordinate transformations](#)
|
[5. Satellite-based positioning \(a/b\)](#)