ANZLIC COMMITTEE ON SURVEYING & MAPPING

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Some Commonly Used Map Projections

This section outlines the features of a selection of more commonly used projects. It is by no means a full list projections which are commonly used today. Also, it describes each projection in its simplest form (e.g. only one Standard Parallel not two).

Contents

Introduction

Comparison of these projections:

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Projection	Type	Key virtues	
Stereographic	azimuthal	conformal	**Created** **Best Us** Poles or continent
Lambert Conformal Conic	conic	conformal	**Created** **Best Us** e.g. USA
Mercator	cylindrical	conformal and true direction	**Created** **Best Us** Equator a navigatio
Robinson	pseudo-cylindrical	all attributes are distorted to create a 'more pleasant' appearance	**Created** **Best Us** Equator
Transverse Mercator	cylindrical	conformal	**Created** **Best Us** north-sou

Azimuthal Projection – Stereographic

The oldest known record of this projection is from Ptolemy in about 150 AD. However it is believed that this projection was well known long before that time – probably as far back as the 2nd century BC.

Today, this is probably one of the most widely used Azimuthal projections. It is most commonly used over Polar areas, but can be used for small scale maps of continents such as Australia. The great attraction of the projection is that the Earth appears as if viewed form space or a globe.

This is a conformal projection in that shapes are well preserved over the map, although extreme distortions do occur towards the edge of the map. Directions are true from the centre of the map (the touch point of our imaginary 'piece of paper'), but the map is not equal-area.

One interesting feature of the Stereographic projection is that any straight line which runs through the centre point is a Great Circle. The advantage of this is that for a place of interest (e.g. Canberra, the capital city of Australia) a map which uses the Stereographic projection and is centred on that place of interest true distances can be calculated to other places of interest (e.g. Canberra to Sydney; or Canberra to Darwin; or Canberra to Wellington, New Zealand).

These are two examples of maps using Stereographic projection over polar areas. In these the radiating lines are Great Circles. Projection information: Stereographic; centred on 140° East and 90° South (the South Pole) and 90° North (the North Pole), with a radius of 30° out from each Pole.

Produced Using G.PROJECTOR – software developed by NASA and the Goddard Institute for Spatial Studies. Projection information: Stereographic; centred on 145° East and 30° South, with a radius of 30° out from the Pole. In this the Great Circles are not as obvious as with the two Polar maps above, but the same principle applies: any straight line which runs through the centre point is a Great Circle. This is an example of how a Great Circle does not have to be a set line of Longitude of Latitude.

Conic Projection – Lambert Conformal Conic

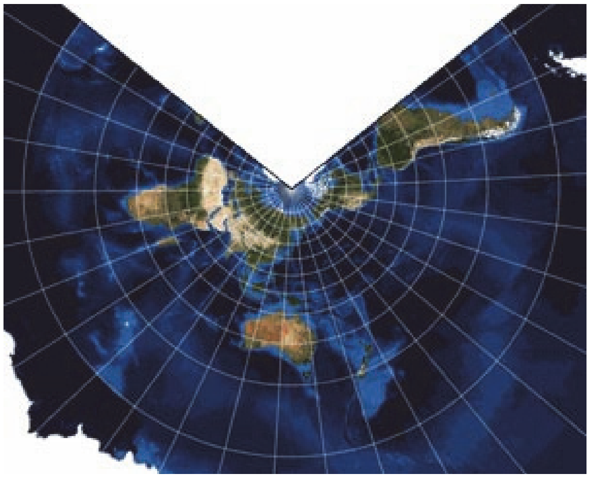
Johann Heinrich Lambert was a German/French mathematician and scientist. His mathematics was considered revolutionary for its time and is still considered important today. In 1772 he released both his Conformal Conic projection and the Transverse Mercator Projection.

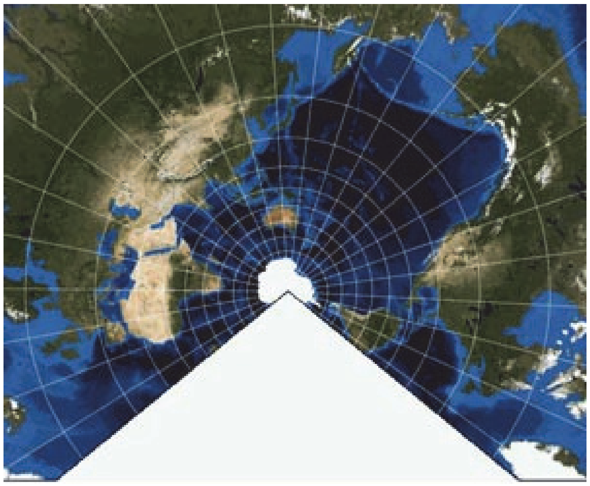
Today the Lambert Conformal Conic projection has become a standard projection for mapping large areas (small scale) in the mid-latitudes – such as USA, Europe and Australia. It has also become particularly popular with aeronautical charts such as the 1:100,000 scale World Aeronautical Charts map series.

This projection commonly used two Standard Parallels (lines of latitudes which are unevenly spaced concentric circles).

The projection is conformal in that shapes are well preserved for a considerable extent near to the Standard Parallels. For world maps the shapes are extremely distorted away from Standard Parallels. This is why it is very popular for regional maps in mid-latitude areas (approximately 20° to 60° North and South).

Distances are only true along the Standard Parallels. Across the whole map directions are generally true.





These two maps highlight the importance of selecting your Standard Parallel(s) carefully. For the first one the Standard Parallels are in the North and for the second they are in the South. Projection information: Lambert Conformal Conic; centred on 140° East and the Equator.

First map has standard Parallels at 30° and 60° North and the second has standard Parallels at 30° and 60° South.

The Lambert Conformal Conic is the preferred projection for regional maps in mid-latitudes. In Australia the national mapping agency prefers to use this projection using 18° and 36° South as the two Standard Parallels. Projection information: Lambert Conformal Conic; centred on 140° East and 25° South, and two Standard Parallels 18° and 36° South.

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