

## SUPPORTING INFORMATION

### Appendix S1: Transformation methods ‘Behrmann Projection’

There exist several ways to transform geographical coordinates (lat/lon WGS84) to a Behrmann equal-area projection.

1. Using ArcMap 9.2 (<http://www.esri.com>)
  - Import pointfile as shapefile
  - Transformation: ArcToolbox → Data Management Tools → Projections and Transformations → Feature → Project
2. Using transformation formulae

The Behrmann projection is a cylindrical equal-area projection with fixed standard parallels at  $\pm 30^\circ$ . The transformation equations are:

$$x = R \lambda \cos \varphi_0$$

$$y = \frac{R}{\sin \varphi_0} \sin \varphi$$

where  $\lambda$  is the longitude,  $\varphi$  is the latitude and  $\varphi_0$  is the standard latitude, all expressed in radians. R represents the earth radius (6378000m).

These formulas yield approximate coordinates because differences in the earth's radius are not taken into account.