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SES101 – Earth Systems
 Week 2: Understanding Maps

1

Maps and Map Projections


- Advantages of Maps
 - Spatial relationships
 - Enormous amount of information
 - Limitless possibilities
- Limitations of Maps
 - Impossible to present a “spherical” planet on a flat surface.
 - All flat maps are distorted

11

Maps and Map Projections



- Need to be aware of the projection, datum and coordinate system of your data before integrating in a GIS



12

Map Projections – Conformal


- Correct shape but incorrect size.
- Example: Mercator Projection, Lambert’s Conformal Conic

13

Map Projections – Equal Area

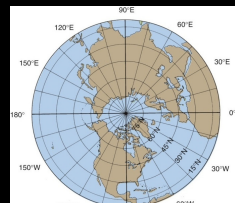
- Equal-area maps: correct size but incorrect shape.
- Essential when examining spatial distribution of any element:
 - People
 - Churches
 - Cornfields
 - Volcanoes
- Example:
 - Mollweide,
 - Albers’ equal area,
 - Lambert’s equal area



14

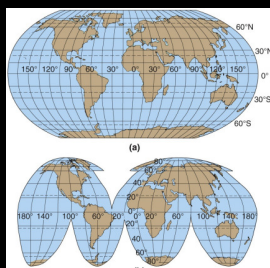
Map Projections – Equidistant

- No flat map depicts correct distance
- On small maps, distances errors are minor.
- Equidistance: constant scale
- Example: Equidistant conic, azimuthal equidistant



Map Projections – Compromise

- Neither conformal or equal area, but a compromise between the two
- Example: Robinson



Universal Transverse Mercator

- Between 84°N and 84°S latitude – divided into North/South columns of 6° longitude wide – 'zones'
- Zones are numbered from 1-60 eastward
- Transverse Mercator projection used in each zone
- Coordinates are given in each zone in *meters* as Eastings and Northings, representing distance from origin (bottom left corner of zone)
- E.g. Darwin: UTM Zone 52S 700187 (Easting), 8621594 (Northing)



17