

Map elements:

1. Title

A map's title provides important information about the map's purpose and goals. A title should express as accurately as possible the general information depicted by the map (e.g. "Demographic Distribution of the Big Island of Hawaii"; "Topography of the Island of Hawaii).

2. Legend (key)

A map contains symbols, icons, lines and colors that represent unique features. A legend or key provides information on the meaning of these symbols. Because map symbols' meanings vary from region to region, a clear and concise legend is critical for conveying the distinctive characteristics of the map.

3. Scale

Scale is an important consideration when creating maps for different purposes. It dictates how much detail could be placed on a limited piece of paper. The larger the data covered on the map, the less detail can be dedicated to it. Also, large scale means small area covered by the map (large amounts of detail) [1]. There are three different types of scales

- a. *Graphical scale* – A graphical scale bar is useful for maps that are going to be reduced in size when printing. Both the main map body and the scale bar are simultaneously resized, so the scale bar will be correct for the resized map. It also allows the use of scales that are not multiples of thousands (1:2,345,321). [2, p. 9-13]
- b. *Fractional scale (representative fraction)* – usually used for maps that need to be published at a specified scale in multiples of thousands (1:500,000). Once this scale has been added to the map, the mapped should not be changed. [2, p. 9-13]
- c. *Verbal scale* – verbally expressing the scale, e.g. "one inch represents ten miles"

4. Orientation

Although a general assumption is that the top of the map points to the North, this might not always be the case. With a north arrow placed on the map (pointing in the correct direction), a user can determine direction. Some maps, such as topographic maps, will point to "*true north*" (the north pole) and to *magnetic north* (where a compass points). [3]

5. Neatline

A neatline is the border of a map. It helps to define the edge of the map area and obviously keeps things looking "neat." [3]

6. Color

Just as there are many types of color maps, there are also many different color schemes used by cartographers. The map user should look to the legend for an explanation of colors on a map [3]. Often colors are used to represent elevation. It is usually represented as a sequence of dark green (low elevation) to brown (hills) to white or gray (highest elevation). Since many people associate green with a fertile region, many map users will see lower elevations, which may be deserts, and assume those areas are filled with lush vegetation [3]. This is another reason for the importance of the map legend.

Research has shown, however, that there are limitations on the number of colors and shades of the same color a human eye can distinguish if they all appear together. Suggestions are that the humans can decipher not more than 12 colors appearing together, and not more than 7 or 8 different shades of the same color. [2, p. 9-7]

7. Source box

Every map should have a source box that containing information about the map. The following items should be included in a source box:

- a. Data source credit
- b. Datum and Projection used
 - i. Projection

All maps distort distance, shape, area, or direction to present a map that meets the users' needs. This is due to the fact that it is not possible to create a completely accurate map from the spherical Earth.

Projection refers to the mathematical method by which the three-dimensional Earth's surface is being portrayed onto a two-dimensional medium. There are many variations, but there are three types of projection methods on which all others are based:

1. Conical
2. Cylindrical
3. Azimuthal

Each method distorts the globe in a different fashion, but, as with any attempt to flatten a round surface, they do distort. Conical projections offer less distortion in the mid-latitudes, while a cylindrical projection distorts less around the Great Circle lines. Azimuthal, being based on a flat plain, distorts more and more as you move from the center. Each can be altered or positioned on the

globe so as to offer the least amount of distortion for any particular area. [1]

ii. Map datums

A map datum is a reference surface, which is defined mathematically and approximates the shape of the earth in particular areas. At different areas across the world, different map datums were (and some still are) used due to the differences in the earth's general surface shape at different places. Specific map datums are more applicable to particular areas or regions than others. [4]

c. Name of map creator

d. Date of map creation

Reference:

1. University of Tennessee Map Library, retrieved on 6/14/04 from <http://www.lib.utk.edu/cic/fact.html>
2. *Introduction to ArcGIS I*, ESRI Educational services
3. About.com, retrieved on 6/14/04 from <http://geography.about.com/library/weekly/aa011298.htm>
4. General GPS FAQs, retrieved on 7/19/04 from http://www.gpswaypoints.co.za/FAQ_basic.htm#What%20is%20a%20Map%20datum