

Topographic Maps

- Map grids: coordinates of latitude and longitude for each location are unique. No two locations on the earth's surface have the same pair of coordinates.
- Latitude:
 - Imaginary lines running E-W, measured N and S from the Equator. Equator at 0° latitude divides the earth into two hemispheres. Range from 0° to 90°N - Northern Hemisphere. 0° to 90°S - Southern Hemisphere.
- Longitude:
 - Imaginary lines running N-S. Prime meridian at 0° longitude passes through Greenwich, UK. Range from 0° to 180°, going west- Western Hemisphere. Range from 0° to 180°, going east- Eastern Hemisphere. International date line at 180° passes through the middle of the Pacific Ocean.

Different types of maps

- Planimetric map: locations of cultural and natural features
- Topographic map: uses contour lines to convey information about elevation
- Map projections:
 - Mercator projection - assumes that lines of latitude and longitude are perpendicular and uniformly spaced. Distortion greatest at poles.
 - Equal-area projection - maintains correct relative sizes of areas.
 - Polyconic projection- adopted by U. S. Geological Survey
- Latitude and longitude are expressed in degrees, minutes, and seconds.

60" (seconds) = 1' (minute)
60' (minutes) = 1° (degree)
- Mean Sea Level (reference for elevation)

Contour Lines (pages 325, 326)

- Contour line: imaginary line that connects all points of equal elevation on the land surface
- Contour interval: the difference in elevation between adjacent contour lines
- Rules generally obeyed by contour lines:
 - Contour lines cannot intersect (cross one another).
 - Contour lines are closed loops, though not necessarily within a given map.
 - Contour lines cannot intersect a standing body of water.
 - Contour lines "V" up a stream valley.
 - A contour line generally runs parallel to adjacent contour lines.
 - Closely spaced contour lines indicate steep slopes.
 - Widely spaced contour lines indicate gentle slopes.
 - Contours that merge indicate a vertical slope (very rare).
- Contour lines in domes and basins:
 - Hachured lines in closed depression

Types of Map Scales

- Verbal scale (example): 1 inch = 2000 feet (1" =2000')
- Ratio scale: 1:24,000
- Bar scale: graphical representation using bar lengths with number labels. (Scale is valid even after photographic reduction or enlargement.)
 - Need to be able to convert from one type to another —
- Different ratios show different amounts of detail and area in maps. For example:

– 1 : 63,360	↓	Less detail, more area
– 1 : 12,000		
– 1 : 20		More detail, less area

Displaying information about elevation

- Relief: the difference in elevation between local high and low spots
- Gradient: relief/ ("path distance")
- Slope: relief/ ("as the crow flies")
- Topographic profiles convey a sense of the ruggedness of an area.
- Vertical exaggeration (VE) in topographic profiles:
 - VE = vertical scale/ horizontal scale
 - Example: vertical scale: 1" = 500'; horizontal scale: 1" = 2000'
$$\frac{1 \text{ " / 500}'}{1 \text{ " / 2000}'} = (1 \text{ " / 500}') \times (2000' / 1 \text{ "}) = 2000 / 500 = 4x$$

Topographic map information (page 328)

