

Slope Morphometry

Absolutely level areas are very rare on the surface of the earth. All landforms are composed of slopes. The slopes are rarely rectilinear over their complete length. The angle of slope is always measured in the steepest direction i.e. perpendicular to the contours. Nearly all slopes consist of a number of distinct parts. Each part is termed as segment. Rectilinear segments are called facets and those which have convex or concave profile are called elements. When a facet is at an angle of 45° it is known as free or fall face. Most slopes consist of a number of segments along the profile. The term foot-slope, mid-slope, crest-slope refer to generalized parts of the profile from base to crest or top. Each segment may contain number of segments.

The normal representation of altitude by contours is quite inadequate as it gives only a generalized picture of the relief. The symbols can be used on their own to make a morphological map or they can be superimposed on an outline contour map to give additional information. By using symbols it is possible to show what may well be important geomorphological detail, such as break of slope in which there is a sharp junction line between the two slopes.

Slope Forms:

An uncomplicated profile generally occurs when the underlying rock is homogeneous, although the reverse is by no means true. Complex slope profile may reflect differences in erodibility related to changes in rock types or they may be due to past changes in climate or base level.

Morphometric data such as inclination of slopes, amplitude of relief, valley density and depth can be obtained from topographical maps. From the contours the following special maps and cartograms can be constructed.

- a) Maps for construction of basic general geomorphological maps.
 - i) Slope maps
 - ii) Maps of density of forms.
- b) Maps for applied and special mapping.
 - i) Maps for relief amplitude
 - ii) Maps for valley depth with isolines of local relief relative altitudes above the nearest valley bottom.

Morphometric maps are useful :

- 1) In Knowing the amplitude of largest tectonic movements and the intensity of denudation
- 2) For technical and economical purposes
- 3) For judging the accessibility of a region
- 4) To establish the area of arable land and forest suited for mechanical treatment.

- 5) For study of sheet and linear soil erosion for taking measures to combat soil erosion.

Slope maps:

A knowledge of slope angle is necessary for the study of present day process and to understand the development of relief. Measurement and representation of slope is required for most geomorphological studies. The slope data are either estimated, measured from the field or air photographs or on contour maps. For practical and theoretical purposes it is necessary to divide the angle of slope into classes. The number of divisions of slope classes depends on the purpose and the scale of map. The International Geographical Union (IGU) commission on Geomorphological Survey and Mapping recommends a scale of six slope categories.

0° - 3°

2° - 5°

5° - 15°

15°-35°

35° - 55°

>55°

Slopes and scarps of 55° or more are generally marked with symbols denoting cliffs, rock walls etc. The slope maps facilitate a synoptic view of the slope of an area and also quantitative comparison and analysis of different areas.

The slope studies are useful mainly in engineering and agriculture. In both cases the relevant material includes aspect of the surface process, the form of land surface and the properties of regolith.