THE TOPOGRAPHIC MAPS OF THE UNITED STATES

The United States Geological Survey is making a series of standard topographic maps to cover the country. This work has been in progress since 1892, and the published maps cover more than 43 percent of the country, exclusive of outlying possessions.

The maps are published on sheets that measure about 16½ by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the standard maps are of nearly uniform size, the areas that they represent are of different sizes. On the larger parts of each map are printed, in graphic style, showing distances in feet, meters, miles, and kilometers. In addition, the scale of the map is shown by a fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale 1 inch = 1 mile means that 1 inch on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 of the same units on the earth's surface.

Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys and the resulting maps have for many years been of three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—water, for example, to mineral development, irrigation, or reclamation of an area—where maps are made with sufficient detail to be used in the publication of maps on a scale of 1 inch = one-half mile or 1 inch = 2,000 feet, with a contour interval of 1 to 100 feet, according to the relief of the particular area mapped.

2. Surveys of areas in which there are problems of average public importance, such as the lands of the states and the United States, and in which the maps are made with sufficient detail to be used in the publication of maps on a scale of 1 inch = nearly 2 miles, with a contour interval of 1 to 200 feet.

3. Surveys of areas in which the problems of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, and the high mountain areas of the northeast, see made with sufficient detail to be used in the publication of maps on a scale of 1 inch = nearly 8 miles, with a contour interval of 1 to 200 feet.

The relief shown is now being used in mapping. From the information recorded on the photograph, planimetric maps, which show only drainage and culture, have been made for some areas in the United States. By the use of stereoscopic plotting apparatus, aerial photographs are utilized also in the making of the topographic maps, which show relief as well as drainage and culture.

A topographic survey of Alaska has been in progress since 1898, and nearly 14 percent of its area has now been surveyed. About 15 percent of the Territory has been covered by maps on a scale of 1 inch = nearly 8 miles. For most of the remainder of the area surveyed the maps published are on a scale of 1 inch = nearly 4 miles. For some areas of peculiar economic importance, covering about 4,300 square miles, the maps published are on a scale of 1 inch = nearly 1 mile (40,000 to the inch). Maps published in Alaska have been covered by photogrammetric methods. The Harvey quadrangle of western Alaska has been covered by photogrammetry, and the resulting maps are published on a scale of 1 inch = nearly 8 miles.

A survey of Puerto Rico is now in progress. The scale of the published maps is 1 inch = nearly 6 miles. The features shown on topographic maps may be arranged in three groups—(1) water, including rivers, lakes, rivers, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; and (3) culture (works of man), such as towns, cities, roads, railroads, and boundaries.

The relief and the features of the land surface are represented on the maps by various symbols. The symbols used to represent the relief are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and creeks by blue lines, and the larger streams by double lines. The larger streams, lakes, and the sea are accentuated by blue water lines or blue tint. Intersecting streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, in which a few maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same elevation above sea level. Such a line could be drawn at any altitude but in practice only the contours at certain regular intervals of altitude are shown. The distance or rise of altitude of the topographic Survey maps is one sea level.

A 20-foot contour would be the shore line if the sea should rise 20 feet above mean sea level. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate gentle slopes, lines that are close together indicate a steep slope, and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.

The topographic maps are used by engineers, surveyors, and land speculators, and by the public generally. They are also used by the United States Geological Survey in its topographic and geologic surveys. The Survey also makes maps for the United States Forest Service for use in the national forests. The Survey also makes maps for the United States Army and the United States Navy for use in military operations.


