

# Map Scales



1:20,000-scale map

To be most useful, a map must show locations and distances accurately on a sheet of paper of convenient size. This means that all things included in the map—ground area, rivers, lakes, roads, distances between features, and so on—must be shown proportionately smaller than they really are. The proportion chosen for a particular map is its scale.

## Large Is Small

Simply defined, scale is the relationship between distance on the map and distance on the ground. A map scale might be given as a drawing (a graphic scale), but usually it is given as a fraction or a ratio— $1/10,000$  or  $1:10,000$ .

These "representative fraction" scales mean that 1 unit of measurement on the map—1 inch or 1 centimeter—represents 10,000 of the same units on the ground. If the scale were  $1:63,360$ , for instance, then 1 inch on the map would represent 63,360 inches or 1 mile on the ground (63,360 inches divided by 12 inches equals 5,280 feet or 1 mile). The first number (map distance) is always 1.



1:63,360-scale map

The second number (ground distance) is different for each scale; the larger the second number is, the smaller the scale of the map. "The larger the number, the smaller the scale" sounds confusing, but it is easy to understand. A map of an area 100 miles long by 100 miles wide drawn at a scale of  $1:63,360$  would be more than 8 feet square. To make the map a more convenient size, either the scale used or the area covered must be reduced.

If the scale is reduced to  $1:316,800$ , then 1 inch on the map represents 5 miles on the ground, and an area 100 miles square can be mapped on a sheet less than 2 feet square (100 miles at 5 miles to the inch equals 20 inches, or 1.66 feet). On the other hand, if the original  $1:63,360$  scale is used but the mapped area is reduced to 20 miles square, the resulting map will also be less than 2 feet square.

Such maps would be easier to handle. But would they be more useful? In the small-scale map ( $1:316,800$ ), there is less room; therefore, everything must be drawn



1:500,000-scale map

smaller, and some small streams, roads, and landmarks must be left out altogether. On the other hand, the larger scale map ( $1:63,360$ ) permits more detail but covers much less ground.

Many areas have been mapped at different scales. The most important

consideration in choosing a map is its intended use. A town engineer, for instance, may need a very detailed map to locate precise sewers, power and water lines, and streets. A commonly used scale for this purpose is  $1:600$  (1 inch on the map represents 50 feet on the ground). This scale is so large that many features—such as buildings, roads, and railroad tracks—that are usually represented on smaller scale maps by symbols can be drawn to scale.

## U.S. Geological Survey Scales

The U.S. Geological Survey (USGS) publishes maps at various scales. The scale used for most United States topographic mapping is  $1:24,000$ . USGS maps at this scale cover an area measuring 7.5 minutes

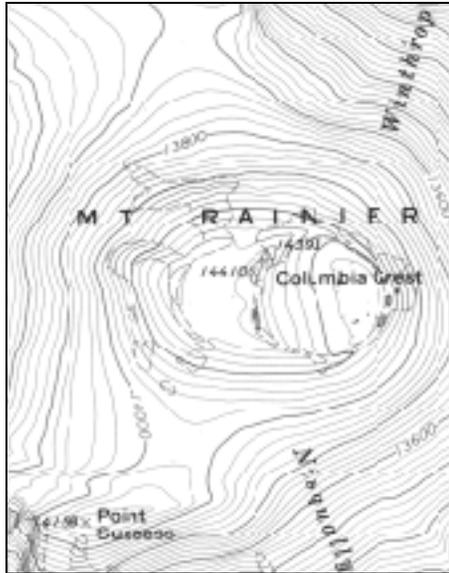
of latitude and 7.5 minutes of longitude and are commonly called 7.5-minute quadrangle maps. Map coverage for most of the United States has been completed at this scale, except for Puerto Rico, which is mapped at 1:20,000 and 1:30,000, and for a few States that have been mapped at 1:25,000. Most of Alaska has been mapped at 1:63,360, with some populated areas also mapped at 1:24,000 and 1:25,000. Maps at 1:24,000 scale are fairly large and provide detailed information

about the features of an area, including the locations of important buildings and most campgrounds, ski lifts, and water mills. Footbridges, drawbridges, fence lines, and private roads are also shown at this scale. Usually these features are omitted from maps in the 1:50,000- to 1:100,000-scale range; these maps cover more area while retaining a reasonable level of detail. Maps at these scales are most often produced using the 30- by 60-minute quadrangle formats.

Small-scale maps (1:250,000 and smaller) show large areas on single map sheets, but details are limited to major features, such as boundaries, parks, airports, major roads, railroads, and streams.

### Information

The table below shows information about maps available from the USGS.



1:24,000-scale map



1:100,000-scale map



1:250,000-scale map

## USGS Maps

Series	Scale	1 inch represents approximately	1 centimeter represents	Standard quadrangle size (latitude by longitude)	Quadrangle area (square miles)
Puerto Rico 7.5 minute	1:20,000	1,667 feet	200 meters	7.5 by 7.5 minute	71
7.5 minute	1:24,000	2,000 feet (exact)	240 meters	7.5 by 7.5 minute	49 to 70
7.5 minute	1:25,000	2,083 feet	250 meters	7.5 by 7.5 minute	49 to 70
7.5 by 15 minute	1:25,000	2,083 feet	250 meters	7.5 by 15 minute	98 to 140
USGS-DMA 15 minute	1:50,000	4,166 feet	500 meters	15 by 15 minute	197 to 282
15 minute*	1:62,500	1 mile	625 meters	15 by 15 minute	197 to 282
Alaska Maps	1:63,360	1 mile (exact)	633.6 meters	15 by 20 to 36 minute	207 to 281
County Maps	1:50,000	4,166 feet	500 meters	County area	Varies
County Maps	1:100,000	1.6 miles	1 kilometer	County area	Varies
30 by 60 minute	1:100,000	1.6 miles	1 kilometer	30 by 60 minute	1,568 to 2,240
30 minute*	1:125,000	2 miles	1.25 kilometers	30 by 30 minute	786 to 1,124
1 degree by 2 degree or 3 degree	1:250,000	4 miles	2.5 kilometers	1° by 2° or 3°	4,580 to 8,669
State Maps	1:500,000	8 miles	5 kilometers	State area	Varies
State Maps	1:1,000,000	16 miles	10 kilometers	State area	Varies
U.S. Sectional Maps	1:2,000,000	32 miles	20 kilometers	State groups	Varies
Antarctica Maps	1:250,000	4 miles	2.5 kilometers	1° by 3° to 15°	4,089 to 8,336
Antarctica Maps	1:500,000	8 miles	5 kilometers	2° by 7.5°	28,174 to 30,462

\* Abandoned map series, but still available for ordering.