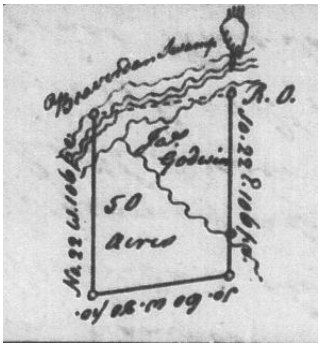
USING MAPS IN GENEALOGICAL RESEARCH

A Board for Certification of Genealogists Webinar



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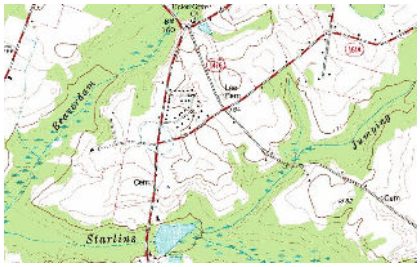
LEFT—James Godwin's 1794 Beaverdam Land Grant



RIGHT—Topo map, same area Sampson County, N. C.

WHAT IS A MAP?

"A representation of the earth or a part of it."[1] Stated more generically a map is "a representation usually on a flat surface of the whole or a part of an area."[2]

The word representation is important. Think of a map as representing information or data. Maps depict the physical qualities of a place. Mapmakers want to show viewers something about that physical area, and decide what to include based on their intentions. A map showing the route of the Oregon trail will, by definition, leave out areas near but not on the trail. A river on that Oregon Trail map may only be shown when the trail crosses it, not for its entire length.

Maps can also depict things that are not purely geographical like the age of mothers at first child's birth.[3] A chromosome map represents the human genome and shows data about specific areas on a chromosome shared by testers. These are also maps.

Mapmakers present things like county boundary lines (and their changes), terrain and watercourses, or U-boat sinkings in World War I. When you see a map take a minute to be sure you understand why it was created. Knowing the mapmaker's intention, or bias, allows you to understand what is shown, what is left out and what is questionable.

USEFUL TYPES OF MAPS FOR GENEALOGY

- Political (country, state, province, county and city) may show courthouses, or older boundaries.
- Physical (terrain, mountains, rivers) often color coded to indicate different levels of elevation

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[1] Department of the Interior, United States Geological Survey, "What Is a Topo Map?" in *Topographic Map Symbols* (https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf).
[2] *Webster's New Collegiate Dictionary* (Springfield, Massachusetts: G. & C/. Merriam, 1977), s. v. "map."
[3] Copyright release could not be secured at press time. See the map at Amy Packham, "Mother's Age at First Birth," (https://www.huffingtonpost.co.uk/2016/03/09/pregnancy-around-the-world-age-of-new-mums_n_9416064.html)

- Topographical (topo) maps show distances and elevation changes, like the steepness of mountain slopes or flatness of land, using a series of connected topographical lines.
- Plat or survey map. Usually created by the surveyor to describe and record the first owner 's government land grant. These maps can show adjoining neighbors, watercourses, trees and other surveying landmarks, as well as distances, compass directions and acreage. Deed books also sometimes contain survey maps for later sales, as do court records for land divisions in probate or court cases.
- Cadastral maps (also called landowner's maps). Created for tax assessment purposes, these maps indicate, ownership, land location, size of parcel, neighbors and landmarks.
- Military or battle maps. Usually large scale and detailed, show roads, houses often with the owner identified, fords or mountain passes, any feature to allow armies to move into enemy territory. If a battle was fought in an area you are researching, check for battle maps which may give owners' names, locations and neighbors.
- Migration maps. These were created for people who planned to migrate themselves and needed to know what the route would be like (like the Emigrant's guide of the Latter-day Saints) to maps created after the fact to show the typical route taken (Oregon Trail) or possible routes available in a certain time period.
- Special purpose (often urban areas). Fire insurance, city ward, Birds-Eye-View or Panorama.

MAP COMPONENTS

Some map components are difficult to grasp at first, scale being the hardest for most people. In genealogy a rule of thumb is that we usually work with large scale maps, because they show more detail. A farmer's barn shows up on a large scale Civil War battle map, but would be invisible on the smaller scale map showing the whole Virginia Campaign. Small scale maps are useful in genealogy too but mostly for things like a migration map that extends over several states, or a map showing Australia and surrounding countries – the big picture.

Scale

- Maps proportionally reduce a place's size. In order to know how much the size has been reduced mapmakers use scale.
- Scale compares distance on the ground to distance on a map.
- Maps show the amount of reduction by a ratio, or by having a graphical key printed right on the map.
    - A typical ratio would be 1:250,000.
    - A typical graphical key might show |_____|
      0 5 miles
- In a ratio format the first number expresses a size (1=one inch) and the second number expresses that number in reality on the ground (250,000 inches).
- For example, many topo maps have a scale of 1:250,000. This means one inch (1) on the map equals 250,000 inches on the ground. Or doing the arithmetic and converting 250,000 to miles, 1 inch on the map equals about 4 miles on the ground.
- Large scale maps give the most detail.

- Consider map ratios of 1:10 and 1:25. The second number determines the scale. 1:10 is larger scale than 1:25 because 1/10 is bigger than 1/25. Similarly, 1:24,000 map is larger scale than 1:63,360.
- Graphical scale uses bars coded to distances. This is useful if a map has been copied to a different size from the original. Enlarging or reducing a map with a key maintains accuracy.

Projection

- Two-dimensional maps of a three-dimensional world create distortion. Projections deal with this distortion.
- The most famous (or infamous, see Robbie Gonzalez in "Resources") projection is the Mercator projection, which distorts maps by making areas in the northern hemisphere appear larger than they are in relation to equatorial areas. Early maps showing north Atlantic shipping routes, while relatively accurate for the route, increase the size of Greenland and if they show it, Africa's size will be greatly diminished. Newer projections aim to depict land masses in more accurate relationship to each other.

Symbols

- Mapmakers use symbols to convey information inside their limited space. A common symbol is † for a church.
- Symbols differ by era, mapmaker or mapmaker's purpose. Always look for the key usually at the bottom of the map, or for map series like current digital topo maps, in a separate document (See https://nationalmap.gov/ustopo/images/US_Topo_Map_Symbols.pdf).

GENEALOGICAL USES OF MAPS

Genealogy is records based, and where a person lived is usually where her/his records are. You need to identify which county held the deeds, court proceedings and tax records. Start by finding political maps showing the county, county courthouse, and any subdivisions like townships in Pennsylvania or Wisconsin. Also use county and state maps to see when a new county was formed, perhaps changing your ancestor's county name, without any physical move at all.

Knowing more about that person's surroundings will tell you more about what their life was like. Did they have easy access to fresh water? Was their soil fertile, rocky or worn-out from too much cotton and tobacco farming? How close was the courthouse? The church? If they lived in a city how close was the nearest park, or bathhouse? How did they get around, was there a river big enough to get produce to market, or for an urban dweller, could they get a better job farther away because there was a streetcar system? All these things influenced your ancestors and can be found on maps.

SOLVING PROBLEMS WITH MAPS

Common genealogical problems can easily be solved with maps. For example, another researcher thinks your common ancestor came to North Carolina from Isle of Wight County, Virginia in the 1750s. You have no knowledge of Virginia. Is this likely in a time period when waterways provided the easiest travel?

Solution—terrain maps showing rivers. Find Isle of Wight in the James River area.

Your ancestor created deeds in three different counties over a seven year period. With the right maps, you can discover he was not a rolling stone, but a home-body who never moved.

Solution—county boundary change maps.

Discovering that two farmers who appear to be right next door to each other on a plat map, in truth were separated by steep terrain, makes their easy interactions less likely.

Solution—terrain or topo map.

James Godwin's Sampson County, North Carolina land grant names Beaverdam Swamp, but which of the three Beaverdam Swamps in Sampson County was it?

Solution—historical gazetteers.

An Orthodox Jewish couple came to Philadelphia in the early twentieth century. Their intended address is garbled on the passenger list. What section of Philadelphia might they have settled in?

Solution—Sanborn Maps, check for synagogues.

GENEALOGY STANDARDS

> Genealogists plan to consult sources naming or affecting their research subjects and their relatives, neighbors, and associates. Their plans often include … geography, …land, …[and] migrations."
>
> Standard 12, Topical Breadth
> *Genealogy Standards*, 13.

The Genealogical Proof Standard stipulates "reasonably exhaustive research."[4] No complex genealogical problem can be considered proved without fully mining any relevant geographic and cartographic data. Starting with full background information, understanding the type of land and what the surrounding community was like, all contribute to "reasonably exhaustive research." Meeting standards 12, Broad Context, and 14, Topical Breadth also contribute to good genealogy research.

Some genealogical proofs require making your own maps. This can be a very important step in getting to know the neighborhood where an ancestor lived. People usually lived near family members, kin, in-laws and fellow religionists. Difficult problems of identity or kinship require developing this kind of neighborhood knowledge, variously called cluster, neighborhood research or as Elizabeth Shown Mills calls it finding the FAN Club (Friends, Associates and Neighbors). Mills points out

> When planning research, genealogists consider historical boundaries and their changes, migration patterns and routes, and sources available for potentially relevant times and places.
>
> Standard 12, Broad Context,
> *Genealogy Standards*, 12.

[4] The Board for Certification of Genealogists, *Genealogy Standards,* (Nashville: Ancestry, 2014), 1-2.

"When those we study left no document to handily supply the information we seek, we often find it in the records created by members of their FAN club."[5]

When doing genealogy research according to the standards ask yourself if you have consulted all the sources that any competent genealogist would consult. Don't limit your research to those items that are easily found online, or that you already know. Finding maps, and just the right map, can greatly increase your success at solving genealogical problems you face. Learning to plat maps yourself or to create hand-drawn (not necessarily to scale) maps helps you picture the lay of the land, understand your ancestor better and figure out what really went on in their lives.

RESOURCES

Books

Arphax, Landowners' Maps, (https://arphax.com). Arphax sells books (around $40 each) for 23 states with over 400 maps of the first landowners. The best coverage is in Alabama, Arkansas, Illinois, Indiana, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Texas, and Wisconsin. See *HistoryGeo* in "Websites" section for their online products.

Board for Certification of Genealogists, *Genealogy Standards*, 50th Anniversary Edition, (Nashville, Tennessee: Ancestry.com, 2014), 1–2, 12, and 13.

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Eales, Anne Brunner and Robert M. Kvasnicka, *Guide to Genealogical Research in the National Archives*, 3rd ed., (Washington D. C.: NARA, 2000), Chapter 19, "Cartographic Records," 339–348, and "Checklist of National Archives Publications Relating to Cartographic Records," 348.

Kashuba, Melinda, PhD, *Walking with Your Ancestors: A Genealogist's Guide to Using Maps and Geography* (Cincinnati: Family Tree Books, 2005). Some aspects are now dated but the work is still useful for its clear description of general geographic and cartographic concepts in a genealogical context.

Ladd, Richard S., *Maps Showing Explorers' Routes, Trails, and Early Roads in the United States: An Annotated List* (Washington, D.C.: Library of Congress, 1962), 300 maps.

Leubking, Sandra Hargreaves, "Land Records," 431–496, "Survey Systems and Terms," 436–7, "Creating a Plat," 438, in Loretto Dennis Szucs and Sandra Hargreaves Leubking, *The Source: A Guidebook of American Genealogy*, 3rd edition (Provo: Ancestry Publishing, 2006).

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Monmonier, Mark, "How to Lie with Maps," *The American Statistician* (January 1996) 51(2); from https://www.researchgate.net/publication/37420071_How_to_Lie_with_Maps.

[5] Mill, Elizabeth Shown, QuickLesson 11: Identity Problems & the Fan principle (https://www.evidenceexplained.com/content/quicklesson-11-identity-problems-fan-principle)

Schiffman, Carol Mehr, "Geographic Tools: Maps, Atlases, and Gazetteers," in Meyerink, Cory, ed., *Printed Sources: A Guide to Published Genealogy Records* (Salt Lake City: Ancestry, 1998), 95–144.

Stephenson, Richard W., comp., *County land ownership maps in the Library of Congress through 1900,* (https://www.loc.gov/resource/g3701g.ct004064/).

_____, *List of Geographical Atlases in the Library of Congress*, 8 vols. (Washington D.C.: Library of Congress, 1909–1974).

Thorndale, William, and William Dollarhide. *Map Guide to the U.S. Federal Censuses, 1790—1920.* (Baltimore: Genealogical Publishing Company, 1987).

Waldman, Carl, *Atlas of North American Indians* (New York: Facts on File, 1985), 20 roads and trails.

Gazetteers and Geographical names

Geographic Names Information System (GNIS) (https://nhd.usgs.gov/gnis.html). Physical and cultural names, both current and historical. Verify names here or at National Map.

GeoNames (http://www.geonames.org) 8,000,000 place names, links to Google.

Articles

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Fonkert, Jay, "Geo-Genealogy," *NGS Magazine* (April–June 2013), 36–42.

Gonzalez, Robbie, "Africa's True Size Will Blow You Away," *io9* (http://io9.gizmodo.com/africas-true-size-will-blow-you-away-1441076531)

Green, Karen Maurer, CG, and Birdie Monk Holsclaw, CG, "Beginning at a Black Oak…": Hachenberger Evidence from a Lancaster County, Pennsylvania, Neighborhood Reconstruction, *National Genealogical Society Quarterly*, 120 (June 2012), 105-22.

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Library of Congress, Sanborn [Fire Insurance] Keys, Legends and Symbol Sheets, (https://www.loc.gov/rr/geogmap/sanborn/san2a.html). Also, see Key for Fireproof Construction, Classification of Buildings and Special Hazards (https://www.loc.gov/rr/geogmap/sanborn/images/sankey22c.jpg). Also, "Sanborn Maps – Related Resources" for state by state holdings in institutions outside the Library of Congress (https://www.loc.gov/rr/geogmap/sanborn/san3.html)

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Plante, Trevor K. "Enhancing Your Family Tree with Civil War Maps," *Prologue* (Summer 2003) vol. 35, number 2, (https://www.archives.gov/publications/prologue/2003/summer/civil-war-maps.html).

United States Geological Survey, "What Is a Topo Map?" in *Topographic Map Symbols* (https://pubs.usgs.gov/gip/TopographicMapSymbols/topomapsymbols.pdf). Shows current types of symbols used on USGS topo maps, and explains topo maps in general.

"Why Do People Hate the Mercator Projection?", *YouTube* (https://www.youtube.com/watdch?v=qPKOW1A9H0M). A quick explanation of the Mercator projection and the subsequent attempts to correct its distortions, including the most commonly used projection today (Mollweide).

Websites & Institutional Holdings Online

Ancestry > Research > Catalog > "Germany, Topographic Maps, 1860–1965" > Browse > Übersichtsblatt > Übersichtsblatt, (http://www.ancestry.com), Pre-World War I German empire with landowners.

Commercial Atlas & Marketing Guide, (Chicago: Rand McNally, 2010). Found in libraries.

Cyndi's List of Genealogical Sites on the Internet—Maps, Gazetteers & Geographical Information (https://www.cyndislist.com/maps/)

David Rumsey (https://www.davidrumsey.com/). 86,000 maps online, including images from atlases and printed books, tools to allow layering of maps.

Dahlin, Terry and Scott Jackson, "Utilizing Historic Maps & Documents in a Modern Geographic Information System," recorded webinar, Utah Genealogical Society, (https://ugagenealogy.org/blog.php?sid=3&page=1&nr=25&cid=A&tf=A&st1=T&srch1=utilizing%20historic%20maps). One hour and 28 minutes, covers land surveying and terminology, using Geographic Information Systems (GIS) starts around 51 minutes.

Eichholz, Alice, ed. *Ancestry's Red Book, American State, County, and Town Sources*. (Salt Lake City, Utah: Ancestry, Inc., 1992); *"Ancestry's Red Book" Ancestry* (http://search.ancestry.com/search/db.aspx?dbid=3249), a map of each state with current (1992) political subdivisions.

*HistoryGeo (*https://www.historygeo.com/). Links historic maps to individual people. 123,000,000 landowners and 4,000 historic maps. Subscription options vary, $59/year. See also Arphax listing in the "Books" section.

Library of Congress, (https://www.loc.gov/collections/?q=maps). 5,500,000 maps, 40,000 digitized, numerous finding aids including extensive explanatory essays on using the collection including historical notes.

_____, "Worlds Revealed [Blog]: Geography and Maps at the Library of Congress" (https://blogs.loc.gov/maps/), if you love maps, you will enjoy this blog.

Newberry Library, *Atlas of Historical County Boundaries* (http://publications.newberry.org/ahcbp/index.html) all U.S. county boundary changes in text, as well as interactive maps. Maps are downloadable in KMZ format to overlay in Google Earth or for desktop GIS programs.

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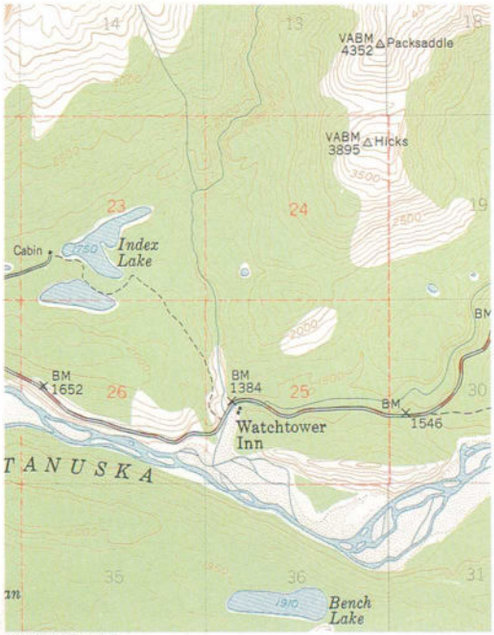
Paulin, Charles O., *Atlas of the Historical Geography of the United States*; digital version (http://dsl.richmond.edu/historicatlas/). An incredibly useful atlas, rates of travel, ethnic

mixes, railroad maps, industry and commerce. Images available for non-commercial use. Also available at *David Rumsey Map Collection*.
Perry-Castañeda Library, University of Texas (Austin) (http://www.lib.utexas.edu/maps/) 70,000 maps.
Sayre, Rick, "Using Military Maps in Genealogy," *Legacy Family Tree*, webinar, (https://familytreewebinars.com/ricksayre).
_____, "Finding and Using Land Ownership Maps," *Legacy Family Tree*, webinar, (https://familytreewebinars.com/ricksayre).
United States Dept. of the Interior, Bureau of Land Management (https://www.blm.gov/maps)
_____, National Meridian Map, (https://www.blm.gov/sites/blm.gov/files/meridianmap09_0.jpg)
_____, General Land Office Records (https://glorecords.blm.gov/default.aspx). Land patents by name, location, survey plats and field notes, land status notes.
United States Geological Survey, "US Topo Quadrangles—Maps for America" (http://nationalmap.gov/ustopo/index.html). These computer-produced topo maps, are free to download. Recent editions show public land survey lines, but do not always show some previously shown features like cemeteries (if they cannot be currently verified).
United States Geological Survey, The National Map Download, "Historical Topographical Maps" (https://viewer.nationalmap.gov/basic/).
War of the Rebellion Atlas—David Rumsey or Baylor University Libraries (http://www.davidrumsey.com/luna/servlet/view/all/what/Atlas+Map/when/U.S.+Civil+War/?os=0). (http://digitalcollections.baylor.edu/cdm/landingpage/collection/tx-wotr).

Map Creation and Software

AniMap. Software (https://goldbug.com/animap/), county boundaries and historical maps.
Deedmapper. Software (http://www.directlinesoftware.com). Create your own maps over a topo map. Not available for Macs. *DeedPool* contains free, user-submitted ownership maps, especially for Virginia.
Google Earth, My Maps (https://www.google.com/maps/about/mymaps/)
My Topo. Software (http://map-pass.mytopo.com/about/index.asp). See Rondina Muncy article above.

All URL's valid as of 24 May 2018



1:63,360 scale

Map Scales

U.S. Department of the Interior
U.S. Geological Survey
Earth Science
Information Center (ESIC)

To be most useful, a map must show locations and distances accurately on a sheet of paper of convenient size. This means that everything included in the map—ground area, distance, rivers, lakes, roads, and so on—must be shown proportionately smaller than it really is. 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 in a drawing (a graphic scale), but it usually is given as a fraction or a ratio—1/10,000 or 1:10,000.

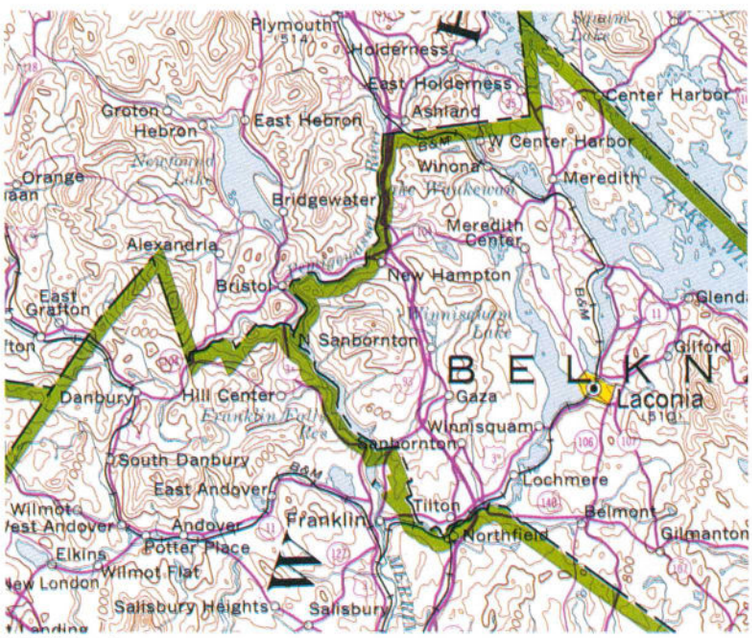
These "representative fraction" scales mean that one unit of measurement on the map—1 inch or 1 centimeter—represents 10,000 of the same units on the ground. If the scale were 1:63,360, for instance, then 1 inch on the map would represent 63,360 inches or 1 mile on the ground (63,360 inches divided by 12 inches = 5,280 feet or 1 mile). The first number (map distance) is always 1. The second number (ground distance) is different for each scale; the larger this 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 this map a more convenient size, either the scale used or the amount of area included 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/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.

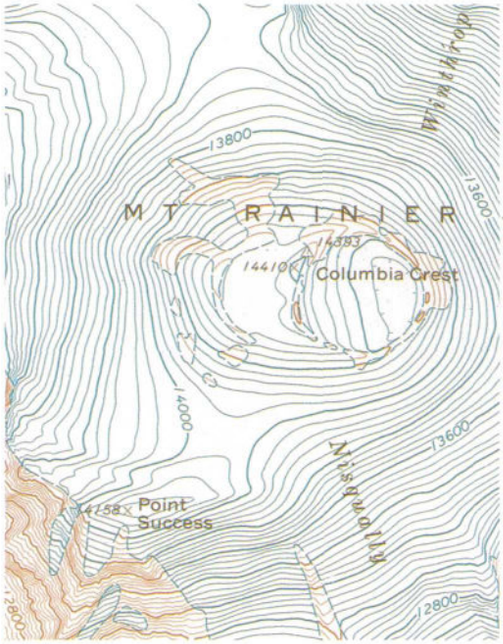
Such maps would be much handier. But would they be more useful? In the small-scale map (1:316,800), there is less room; therefore, everything must be drawn smaller, and some landmarks must be left out altogether. On the other hand, the larger scale map (1:63,360) permits more detail, but it also covers much less ground.

Many areas have been mapped at different scales. When choosing a map—that is, when choosing a scale—the most important consideration is its intended use. A town engineer, for instance, may need a very detailed map in order to precisely locate house lots, power and water lines, and streets and alleys in a community. 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, railroad tracks—that are usually represented on smaller scale maps by symbols can be drawn to scale.

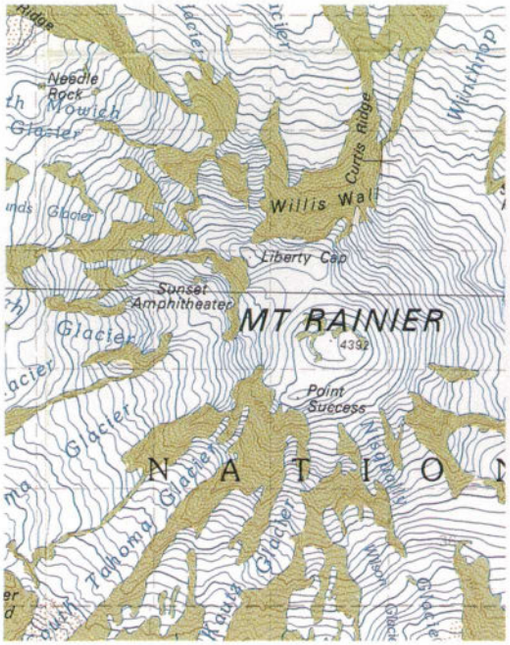


1:500,000 scale

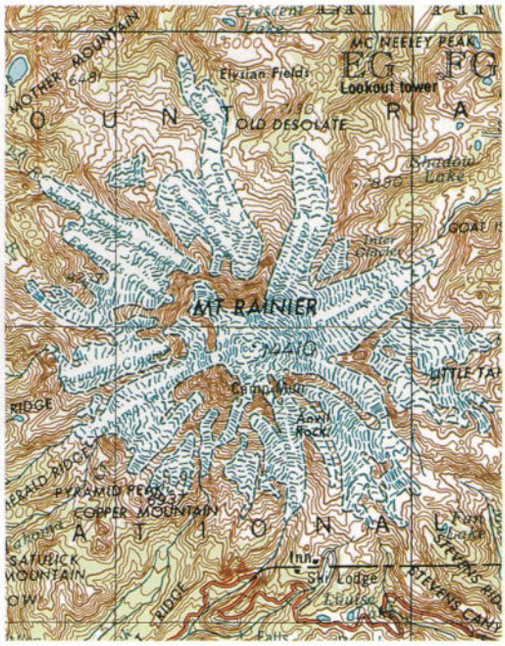
1:20,000 scale



1:24,000 scale



1:100,000 scale



1:250,000 scale

U.S. Geological Survey Scales

The U.S. Geological Survey publishes maps at various scales. The scale used for most U.S. topographic mapping is 1:24,000. Maps published at this scale cover 7.5 minutes of latitude and 7.5 minutes of longitude; they are commonly called "7.5-minute quadrangle" maps. Map coverage for 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 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.

The 1:24,000 scale is fairly large. A map at this scale provides detailed information about the natural and manmade features of an area, including the locations of important buildings and most campgrounds, caves, ski lifts, watermills, and even drive-in theaters. Footbridges, drawbridges, fence lines, private roads, and changes in the number of lanes in a road are also shown at this scale. They would be omitted, usually, 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 most often use the 15-minute or 30-by-60 minute quadrangle formats.

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

For more information contact any Earth Science Information Center (ESIC) or call 1-800-USA-MAPS

or the following office:

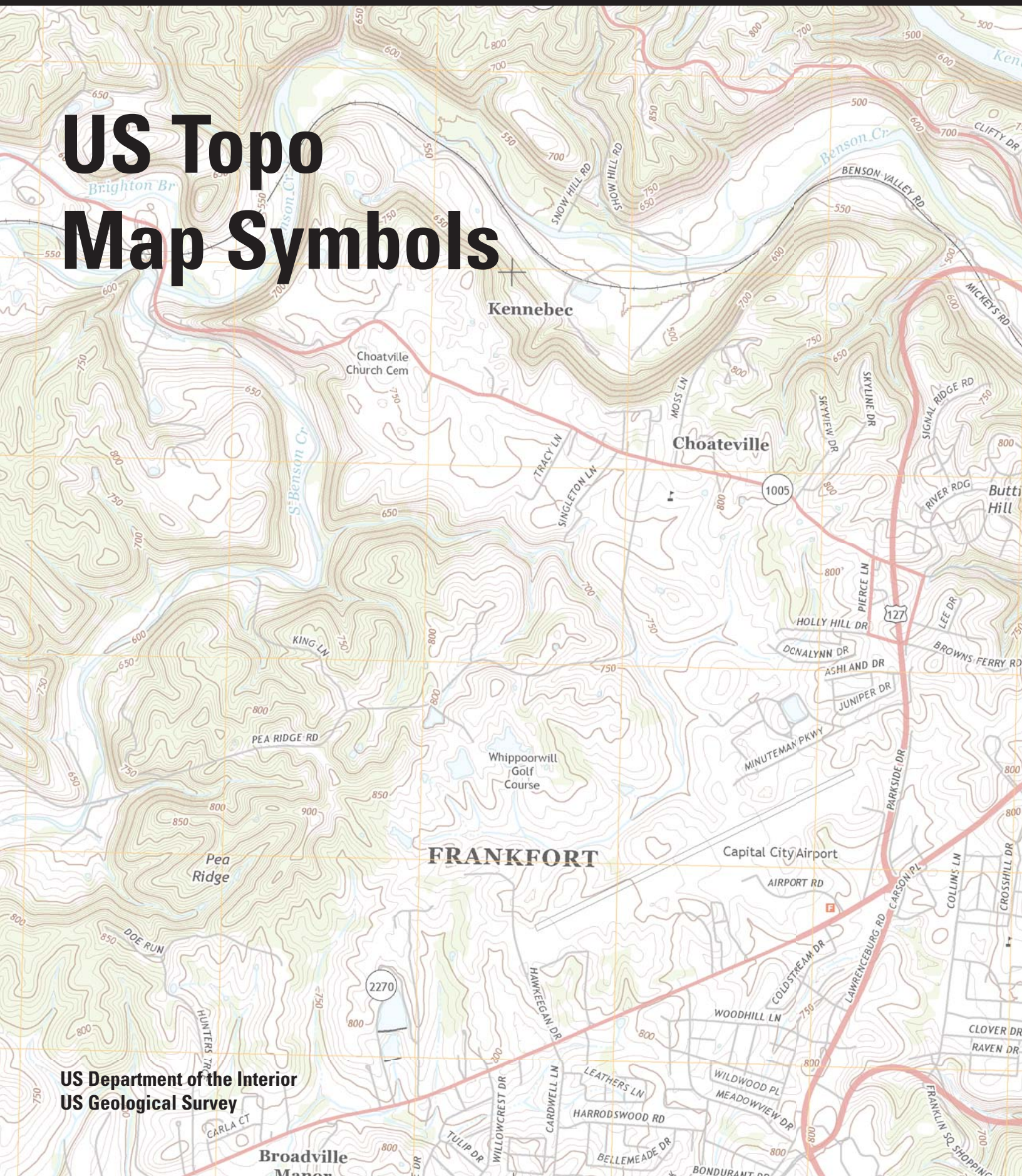
USGS Topographic Maps

Scale	Series	1 inch represents	1 centimeter represents	Standard quadrangle size (latitude-longitude)	Quadrangle area (square miles)
1:20,000	Puerto Rico 7.5 minute	1,667 feet (about)	200 meters	7.5 × 7.5 min.	71
1:24,000	7.5 minute	2,000 feet	240 meters	7.5 × 7.5 min.	49 to 70
1:25,000	7.5 × 15 minute	2,083 feet (about)	250 meters	7.5 × 15 min.	98 to 140
1:50,000	Intermediate	.8 mile (about)	500 meters	NA	county
1:62,500	15 minute	1 mile (about)	625 meters	15 × 15 min.	197 to 282
1:63,360	Alaska 1:63,360	1 mile	634 meters (about)	15 × 20 to 36 min.	207 to 281
1:100,000	Intermediate	1.6 miles (about)	1 kilometer	30 × 60 min.	1,568 to 2,240
1:100,000	Intermediate	1.6 miles (about)	1 kilometer	NA	county
1:125,000	30 minute	2 miles (about)	1.25 kilometers	30 × 30 min.	788 to 1,128
1:250,000	United States	4 miles (about)	2.5 kilometers	1° × 2° or 3°	4,580 to 8,669
1:250,000	Antarctica	4 miles (about)	2.5 kilometers	1° × 3° to 15°	4,089 to 8,336
1:500,000	Antarctica	8 miles (about)	5 kilometers	2° × 7.5°	28,174 to 30,462
1:500,000	State maps	8 miles (about)	5 kilometers	NA	NA
1:1,000,000	United States	16 miles (about)	10 kilometers	4° × 6°	73,734 to 102,759

USGS
science for a changing world

The National Map

US Topo Map Symbols



US Department of the Interior
US Geological Survey

What is a US Topo map?

A US Topo map is a digital topographic map that covers 7.5-minutes of longitude by 7.5-minutes of latitude and is produced at a scale of 1:24,000. US Topo maps are freely distributable and are available for download on the Web from the USGS Store (*http://store.usgs.gov*) in Portable Document Format (PDF) with geospatial extensions (GeoPDF®, a registered trademark of TerraGo Technologies). PDF maps can be viewed and printed with any conforming PDF software. Versions 9.x and late of Adobe® Reader® and Acrobat® software provide access to the geospatial functionality of the US Topo map. Adobe Reader is available for free at *http://get.adobe.com/reader*. Geospatial functionality is enhanced with the TerraGo® Toolbar™, a plug-in to the Adobe software that may be downloaded for free at *http://usgs.terragotech.com/home*. More information about US Topo maps and their use is available at *http://nationalmap.gov/ustopo*.

The base data layer of a US Topo map is a recent orthographic aerial photograph. These orthoimages have been corrected to remove scale distortions that result from the varying terrain and deviations of the aircraft's position from the true vertical. The maps include contours that show the shape of the Earth's surface, hydrographic features such as lakes and rivers, roads, boundaries, and geographic names. Additional data from the geographic data themes of transportation, names, elevation, hydrography, boundaries, structures (such as fire stations) and land cover (such as woodland tint) is being added to the maps as they are updated, resulting in a product that will become progressively more robust over time. Feature data is incorporated from national Geographic Information System (GIS) databases under the stewardship of USGS data programs. The US Topo map is intended for conventional map users, not for advanced GIS analysis. However, most of the data sources used are in the public domain and may be downloaded for free from *The National Map* (*TNM*) (*http://nationalmap.gov*).

US Topo maps are revised on a three-year production cycle.

Symbols on US Topo Maps

The underlying orthoimage for each US Topo map shows those features on the Earth's surface that are visible to the eye. Because each map is made at a scale of 1:24,000 (one inch on the map represents 24,000 inches or 2,000 feet on the ground), selected features are also shown and emphasized by symbols, geographic names, and highway route numbers.

Map features may be represented as points, lines, or polygons. They incorporate different colors and patterns to distinguish between feature types and to show each feature's importance. For example, a perennial stream is symbolized by a solid blue line while an intermittent stream is shown by a blue dashed and dotted line. A large reservoir is depicted by a polygon while a small reservoir may be shown by a point symbol if it is too small to show as a polygon.

Point symbols of different shapes and sizes depict features such as structures, dams, gates, rocks, waterfalls, and wells. Linear map symbols (lines) show such features as roads, rivers, boundaries, and contours. Color is used to show the class of information: topographic contours in brown, streams and rivers and other hydrographic features in blue, and roads in black and red. Areal features are outlined to depict the areal extent and may also be emphasized by a color tint. Names and labels are shown in different type fonts, sizes, and colors.

The unique feature of a topographic map is the contour. These lines do not exist on the Earth's surface. They join points of equal elevation above a zero level surface (such as Mean Sea Level) and therefore show heights of the land and reveal the shape of the land surface. Heavier brown lines are index contours and are labeled with the elevation they represent. Closely spaced contours indicate a steep land slope; widely spaced contours show more level ground. The elevation difference between adjacent contours is the contour interval. A map of a relatively flat area may have a contour interval of 10 feet. In steep areas an interval of 100 feet or more may be used to avoid coalescence or convergence of the contour lines. The contour interval is always noted below the bar scale in the map marginalia.

The cartographic representation of roads has been updated from a characterization based on organizational maintenance (Interstates, US routes, State routes, etc.) to a functional classification defined as follows:

- Expressway[1]: A controlled access, divided arterial highway for through traffic.
- Secondary Highway[1]: Hard surface highways including secondary State routes, primary county routes, and other highways that connect principal cities and towns, and link these places with the primary highway system.
- Local Connector[1]: Hard surface roads not included in a higher class and improved, loose surface roads passable in all kinds of weather. These roads are adjuncts to the primary and secondary highway system and represent major arteries through populated places.
- Local Road[1]: Roads used primarily for local traffic.

[1] Federal Highway Administration Planning Glossary - *http://www.fhwa.dot.gov/planning/glossary/glossary_listing.cfm.*

STRUCTURES

- Cemetery
- Fire Station
- Hospital
- Police
- Post Office
- Prison
- School
- State Capitol
- Oil/Gas Pipeline*

TRANSPORTATION

Airport Features

- Airport Runway

Railroad Features

- Railroad

Road Features

- Expressway
- Secondary Hwy
- Ramp
- Local Connector
- Local Road
- 4WD
- Ferry
- Tunnel
- Trail

Road Shields

- Interstate Route
- US Route
- State Route
- Forest Service Primary Route
- Forest Service Secondary Route
- Forest Service High Clearance Route

PLSS

- Township/Range — T 34 N R 79 W
- Township/Range (protracted) — T 34 N R 79 W
- Section — 1 — 36
- Section (protracted) — 1 — 36
- Land Grants

HYDROGRAPHY

- Gaging Station
- Gate
- Rock
- Spring
- Swimming Pool
- Well
- Perennial Stream
- Intermittent Stream
- Submerged Stream
- Earthen Dam
- Nonearthen Dam
- Dam
- Levee
- Lock Chamber/Spillway
- Rapids
- Waterfall
- Perennial Lake
- Intermittent Lake
- Reservoir
- Nonearthen Reservoir
- Area of Complex Channels
- Inundation Area
- Playa
- Wash
- Settling Pond
- Tailings Pond
- Ice Mass
- Canal/Ditch
- Flume
- Pipeline
- Underground Pipeline
- Tunnel

HYDROGRAPHY – *continued*

- Underground Conduit
- Coastline
- Nonearthen Shore
- Reef
- Foreshore
- Estuary
- Ocean
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland

TERRAIN

Contour Features

- Index
- Intermediate
- Supplemental
- Depression Index
- Depression Intermediate
- Depression Supplemental

Shaded Relief

- Shaded Relief

BOUNDARIES

Jurisdictional Boundaries

- International
- State or Territory
- County or Equivalent

Federal Administered Lands

- Forest Service
- National Park Service
- Department of Defense
- National Cemetery
- Bureau of Land Management*
- Fish and Wildlife Service
- AIANNH Area*

LAND COVER

- Woodland

IMAGES

- Orthoimage

*Currently on Alaska US Topo maps only

ABBREVATIONS

• Hwy	Highway
• AIANNH	American Indian, Alaska Native, and Native Hawaiian Area
• 4WD	Four Wheel Drive

Note: Symbols use transparent color. When these symbols overlap the colors blend. This alters their appearance from how they are represented in the map legend.