

TOPOGRAPHIC MAPS



The Basics



Canada

Topographic maps are used for a wide variety of applications, from camping, canoeing, hunting and fishing, to urban planning, resource development and surveying. Why? Because they accurately represent, to scale, the earth's features on a two-dimensional surface; that is to say, every feature shown on a map is where it actually is on the earth's surface.

Topographic maps offer detailed information on any particular area. They are an excellent planning tool and guide and at the same time, help to make your outdoor adventures enjoyable and safe.

To help you understand what topographic maps are and how to use them, we have answered some of the most commonly asked questions. You will also find tips on how to get the most out of a topographic map, an explanation of topographic terms and the symbols used to depict popular features.

Answers to Your Questions About Topographic Maps

WHAT IS A TOPOGRAPHIC MAP?

A topographic map is a detailed and accurate graphic representation of cultural and natural features on the ground.

WHAT TYPE OF INFORMATION CAN I EXPECT TO FIND ON A TOPOGRAPHIC MAP?

A topographic map identifies numerous cultural and natural ground features, which can be divided into the following categories:

culture:	roads, buildings, urban development, boundaries, railways, power transmission lines;
water:	lakes, rivers, streams, swamps, rapids;
relief:	mountains, valleys, slopes, depressions;
vegetation:	wooded and cleared areas, vineyards and orchards;
toponymy:	place names, water feature names, highway names.

Refer to the legend on the back of a national topographic map for a complete listing of all features and their corresponding symbols.

Information along the map borders and on the back of the map provides valuable details to help you understand and use a topographic map; for example, the map scale and scale conversion, the legend and the currency of the map information.

WHAT DO THE DIFFERENT COLOURS REPRESENT?

Seven colours can be found on a map, each relating to different types of features. *Note: Northern areas of Canada are mapped in black and white (monochrome).*

Black shows cultural features such as buildings, railways and power transmission lines. It is also used to show geographical names (toponymy), certain symbols, geographic coordinates, precise elevations, border information and surround information.

Red is used for paved roads, highway numbers, interchange exit numbers, certain symbols as well as for names of major transportation routes. A red tint is used to show urban development.

Orange indicates unpaved roads and unclassified roads and streets.

Brown shows contour lines, contour elevations, spot elevations, sand and eskers.

Blue represents water features, such as lakes, streams, falls, rapids, swamps and marshes. The names of water bodies and water courses are also shown in blue, as are magnetic declination and UTM (Universal Transverse Mercator) grid information.

Green is used for wooded areas, orchards and vineyards.

Grey is used on the back of the map to indicate the different symbols and a glossary of terms and abbreviations.

Note: Purple can be used to show added information (update) over the original map detail.

WHAT IS THE DIFFERENCE BETWEEN A TOPOGRAPHIC MAP AND A ROAD MAP?

They both show roads, water features, cities and provincial parks, but that's where the similarity ends. Topographic maps also show relief, forest cover, marsh, pipelines, transmission lines, buildings, various types of boundary lines, and many more features.

Topographic maps also show both a geographic grid (latitude/longitude) and a UTM grid (kilometres), allowing the user to determine precise positions.

WHAT IS SCALE?

Scale refers to the relationship between distance on a map and the corresponding distance on the ground. At a scale of 1:50 000 for example, one unit of measure on the map represents 50 000 equivalent units of measure on the ground.

Medium-scale maps (e.g. 1:50 000) cover smaller areas in greater detail, whereas smaller-scale maps (e.g. 1:250 000) cover large areas in less detail.

WHAT SCALE DO I NEED?

A 1:250 000 scale map gives a general overview of a large area and is a perfect guide for pre-trip planning. It covers an area of approximately 18 000 square kilometres or 160 km x 110 km, and depicts numerous aspects of the terrain. Refer to the map detail and natural landmarks to guide yourself through unfamiliar areas.

A 1:50 000 scale map is highly detailed and covers an area of approximately 1 100 square kilometres or 40 km x 28 km. It shows vegetation, cultural information, approved names (toponymy), land elevation and water bodies, in great detail.

Note: A 1:250 000 scale map covers the same area as sixteen 1:50 000 scale maps.

WHAT IS A GRID?

A grid is a pattern of parallel lines intersecting at right angles and forming squares or rectangles, and is used to identify precise positions. For locating your position accurately on the surface of the earth (or map sheet), topographic maps have two kinds of referencing systems:

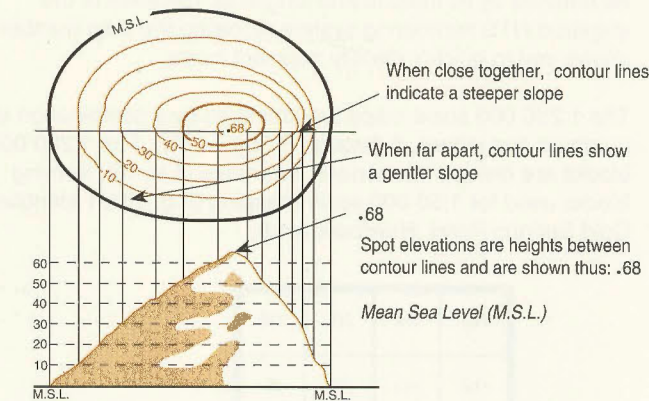
- (1) geographic: degrees, minutes and seconds (latitude/longitude);
- (2) Universal Transverse Mercator (UTM).

CAN GPS BE USED WITH TOPOGRAPHIC MAPS?

Yes - location can be obtained very quickly with a Global Positioning System (GPS) receiver. This satellite receiving system displays a position in terms of latitude, longitude, and height, providing you with exact coordinates for map reference. (Some receivers also provide a direct conversion of position to a selected map grid such as UTM.)

WHAT ARE CONTOUR LINES?

Contour lines connect a series of points of equal elevation and are used to illustrate relief on a map. For example, numerous contour lines that are close to one another show hilly or mountainous terrain; when far apart, they indicate a gentler slope.



HOW CAN I DETERMINE WHERE I AM ON A MAP?

Identify as many features around you as you can, cultural or natural, and locate those same features on your map. Then position the map so that it corresponds with the ground features that you have identified.

If you have a GPS position, you can use the geographic or UTM grid reference system on the map to determine where you are.

HOW CAN I NAVIGATE WITH A COMPASS AND A MAP?

A compass provides direction through bearings (degrees); however, you must consider the magnetic declination (found in the right margin of a topographic map) to obtain accurate bearings. The magnetic declination is calculated for the center of the map and fluctuates annually; the annual change (increasing or decreasing) is shown on the map. For example:

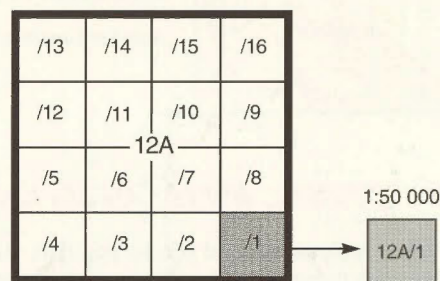
- If the declination in an area is 10° west, add 10° to the setting. If the dial setting was 30°, it should now read 40°.
- If the declination is 10° east, subtract 10° so that the 30° setting will be changed to 20°.

Be sure to check the annual rate of declination change before you set your final compass bearing.

▶ HOW ARE MAP SHEET AREAS DEFINED?

Topographic maps, produced by Natural Resources Canada, conform to the National Topographic System (NTS) of Canada. They are available in two standard scales, 1:50 000 and 1:250 000. The area covered by a given map sheet is determined by its latitude and longitude. Because of the standard NTS numbering system, knowing the map number allows you to quickly identify adjacent maps.

The 1:250 000 scale maps are identified by a combination of numbers and letters, A through P (e.g. 12A). The 1:250 000 blocks are divided into sixteen segments (1 to 16), forming blocks used for 1:50 000 scale mapping (e.g. 12A/1 identifies Cold Springs Pond, Newfoundland).



▶ HOW DO I KNOW WHICH MAP SHEET COVERS MY AREA OF INTEREST?

To order a topographic map, you must know either the location (latitude/longitude) or the name of your area of interest (e.g. major cities, large bodies of water).

You may also order by map sheet number. Index maps are available through the Canada Map Office.

▶ WHERE CAN I PURCHASE TOPOGRAPHIC MAPS?



Topographic maps can be purchased through your local map dealer (listed in the Yellow Pages under "Maps") or through the Canada Map Office, 130 Bentley Avenue, Nepean, Ontario K1A 0E9. Telephone 1-800-465-6277 (Canada and U.S.) or (613) 952-7000.

▶ Topographic Terms Often Used

bearing: the horizontal angle at a given point, measured clockwise from magnetic north or true north to a second point.

classified roads: roads for which surface type, width and use are identified.

contour lines: lines on the map connecting points of equal elevation above mean sea level; using contour lines, relief features can be profiled into a three-dimensional perspective.

elevation: vertical distance from a datum (usually mean sea level) to a point or object on the earth's surface.

horizontal datum: the positional reference or basis for the geographic location of features on a map.

magnetic declination: the angles between the magnetic north and true north expressed in degrees and minutes, east or west from true north.

magnetic north: direction to which a compass needle points.

mean sea level: the average height of the surface of the sea for all stages of tide, used as a reference surface from which elevations are measured.

projection: geometric representation of the curved surface of the earth on a flat sheet of paper.

relief: the physical configuration of the earth's surface, depicted on a topographic map by contour lines and spot heights.

spot elevation: a point on a map where height above mean sea level is noted, usually by a dot and elevation value; it is shown wherever practical (road intersections, summits, lakes, large flat areas and depressions).

surveying: the operation of taking observations or measurements to determine geographic location.

topography: surface features both natural and cultural, collectively depicted on topographic maps.

true north: direction of the northern rotational axis of the earth - the North Pole.

unclassified roads: roads for which the surface is unidentified.

UTM (Universal Transverse Mercator) grid: a square grid system based on the transverse Mercator projection, depicted on maps. It can be used to locate the position of features on the map accurately by distance or direction.

vertical datum: the reference or basis for elevations (usually mean sea level).

▶ Tips

• Know what map scale you're using in order to measure distance. Refer to the scale bar (at the bottom of the map).

1:50 000 scale:
1 cm = .5 km (1 inch = about 0.8 miles)

1:250 000 scale:
1 cm = 2.5 km (1 inch = about 4 miles)

• A legend explaining the symbols used can be found on the back of the map for easy reference.

• Remember that north is always at the top of the map.

• Using a compass along with a topographic map ensures an exact direction for locating features. An approximate but quick way to orient your map is to align the compass needle (when it is pointing north) with the top of the map.

• A map is oriented when it is made to correspond with the ground features it represents. If you know your location and can also identify the position of a distant object, you can orient your map by turning it so it corresponds with the ground features.

• When allowing for magnetic declination, remember: declination in the west, magnetic best (add); declination east, magnetic least (subtract).

• Use contour lines to determine elevations of mountains and flat areas. The closer together the lines are, the steeper the slope.

• Note that contour numbers are often positioned differently, since they indicate the direction of elevation by always reading (pointing) uphill.

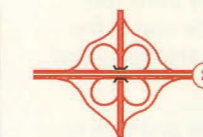
• Some water feature symbols also reveal water flow direction (e.g. direction of flow arrow in rivers, falls symbols pointing downstream).

• At a glance, you can easily identify wooded areas (green) and clearings (white).

• Aerial photographs can be used to enhance the use of your topographic map, by providing an aerial view of the ground features shown on your map sheet. They are available for all map sheets within the NTS from the National Air Photo Library.

▶ Symbols of Popular Features

▶ CULTURE:



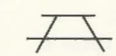
highway and number



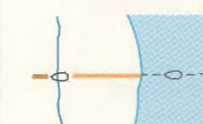
church*



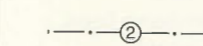
bridge



picnic site*



ferry route



power transmission lines



ski area*



dams



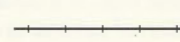
building*



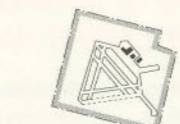
school*



campground*



railway



airport



golf course



historic site*



locks

▶ WATER:



rapids



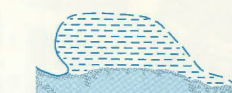
falls



lake



marsh



flooded area

▶ RELIEF:



index contour (every 5th contour)
intermediate contour

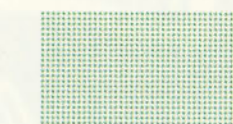


depression contours

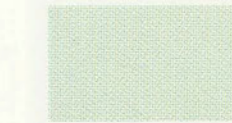
▶ VEGETATION:



wooded area



orchard



vineyard

* Symbol is larger than it appears on a map.