Gmap4

Using An Open Map

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For more documentation see the Gmap4 Help page
Also see the "What is new" page

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1. Introduction

So you are looking at a Gmap4 map. Now what? This document will show you the various things that you can do with that map.

2. Google controls

This section assumes you are looking at the map on a desktop or laptop.

See a streetview	Drag the orange person symbol (near upper left corner) over to the street. If the street displays a blue highlight then streetview images are available. Here is some information from Google on how to use streetview: https://maps.google.com/intl/en/help/maps/streetview/learn/using-street-view.html In order to comply with Goolge's terms of service, streetview is only available if the basemap on the screen is one hosted by Google (Map, Satellite, Hybrid, Terrain).
Zoom	Click the "+" and "-" near the upper left corner.
Scale	The map scale is at the bottom near the right corner. Google displays the scale in metric. To change the scale to miles/feet, click the scale image.

3. Mouse controls

Click-hold-drag	Pan the map
Double click	Center the map at that spot Double-click is disabled on maps that can show GIS overlay layers. You will need to click-hold-drag the map to pan it.
Click	If an overlay is displayed with GIS data, then you can click on that data and see a popup with all the attribute data the GIS server has for the thing that you clicked. If a data file (GPX, KML, KMZ, etc) is displayed then you can often click on the data and see a popup with a description.
Right click	Display coordinates in various formats for the spot you clicked. Also get directions 'to' or 'from' the spot you clicked. Get a Gmap4 link that will open the map centered at the spot you clicked.
Mouse wheel	Zoom Note - If you are looking at a map that is embedded on a webpage then whoever made that Gmap4 link might have disabled mouse wheel zoom. This is done so the mouse wheel will continue to scroll the webpage instead of zooming the map. In this case you will need to use Google's zoom control.

4. Mobile controls

Touch-hold-drag	Pan the map
Double tap	Center the map at that spot Double-tap is disabled on maps that can show GIS overlay layers. You will need to tap-hold-drag the map to pan it.
Tap	If an overlay is displayed with GIS data, then you can tap on that data and see a popup with all the attribute data the GIS server has for the thing that you tapped. If a data file (GPX, KML, KMZ, etc) is displayed then you can often tap on the data and see a popup with a description.
Simulated right click	Tap the '>' symbol at the left edge of the screen and then drag the cursor that appears and then tap that crosshair. Display coordinates in various formats for the spot you clicked. Also get directions 'to' or 'from' the spot you clicked. Get a Gmap4 link that will open the map centered at the spot you clicked.
Pinch and stretch	Zoom

5. "Menu" button

Here is a list of the options you will see under the "Menu" button on a desktop or laptop. A few options are not available on smartphones or other mobile devices.

Terms of service	Please read the Gmap4 terms of service.
Gmap4 Facebook page	If you are a facebook user you can go to the Gmap4 facebook page and 'like' Gmap4.
Help and Quick Start	Open a new window and display the Gmap4 Help page.
Gmap4 Homepage	FAQ, lots of examples, contact, links and more.
Link to this map	Display the link for the map view on the screen.
Embed this map	Display <iframe> code to include this map in a web page
My location	Display your location on a smartphone or tablet.
Search	Display the search bar.
Draw and Save	Trip planning and custom maps. Make a GPX file, delimited text file or map-in-a-link.
Hill shading	Change hill shading for the 't4 CalTopo Hi-res USA' maps.
UTM - USNG - LatLng	Chose type of coordinate format from latitude longitude (3 formats), UTM, MGRS, USNG or turn coordinate display off. A grid is displayed if you select UTM, MGRS or USNG.
Declination	Display present-day magnetic declination for the map center.
Data file	Toggle the map data on and off.
Label	Toggle symbol labels on and off (except for KMZ files).
Streetview	Toogle the streetview symbol. Streetview is only available if the basemap being displayed is hosted by Google (Map, Satellite, Hybrid, Terrain).
Crosshair	Toggle the crosshair symbol at the center of the map

Map tilt	Toggle whether google's aerials tilt when zoomed in. This tilting only happens in certain urban areas.
Directions	Displays instructions for getting directions.
Full screen	Open a new window and display Gmap4. Useful if you are seeing Gmap4 in a small iframe and want a larger view.
About	Display the Gmap4 version number.
Recreation maps	Go to the master web page that leads to many Gmap4 maps that display recreation-related GIS data. Some maps display GIS weather and disaster data.
Property Line Maps	Go to the Property Line Maps website - another service from the developer of Gmap4.
Donate	Open a new window and display the Gmap4 Donate page.

6. Basemap button

The button is located at the upper right corner on desktops/laptops and the lower right corner on smartphones and other mobile devices. **This button always displays the name of the current basemap.** The basemap button opens a menu that lets you change the basemap and turn GIS overlay layers on and off.

Basemap name	Content
Map	Street map from Google
Satellite	Aerial photo from Google.
Hybrid	Aerial photos plus street names and other labels
NAIP Aerial	Aerial photos (USA)
USGS Aerial	Aerial photos hosted by USGS. Relatively high resolution. Partial USA coverage.
t1 Terrain	Terrain from Google (default
t2 MyTopo	Topographic map from MyTopo). USA maps are 1:24,000. Canada maps are 1:50,000.
t3 Topo USGS	Topographic map from USGS via "The National Map"
t4 CalTopo Hi-res USA	Topographic map from CalTopo.com & USGS <=== High resolution topographic map
t5 Canada	Topographic vector maps for Canada
t6 Topo ESRI USA	Topographic - USA
t7 Topo ESRI World	Topographic - Worldwide
t8 Topo OSM Cycle World	Topographic - Worldwide
osm Open Street Map	Open street map
All white basemap	Select this basemap to see just data from any transparent overlays that are 'on'.

The above basemaps are built in to Gmap4 and their names appear in **bold type** when you open the basemap menu. If the map you are looking at has additional basemaps with data coming from a GIS server, then those basemap names will be at the bottom of the list in normal type.

Clicking the basemap button also lets you turn on/off any GIS overlay layers. For more information, please see the section on GIS overlays below.

In some places the NAIP aerials or USGS aerials provide a better image than the Google aerials. Also, both of these sets of aerials are in the public domain and are hosted on federal servers. (It is a violation of Google's terms of service to take a screenshot of an aerial image that Google is hosting.) The USGS aerials only cover part of the USA but are a much higher resolution than the NAIP aerials. Both of these federal servers might be a bit slow at times.

7. U.S. National Grid (USNG) coordinates

For more information on the U.S. National Grid (USNG) and Military Grid Reference System (MGRS) please visit the Gmap4 Help page and download the pdf file "USNG and MGRS Coordinates".

8. Tips for searching

To open the search bar click Menu ==> Search. Type something you want to search for and press enter or click one of the buttons in the search bar. In general, you can search on:

- A broad range of things related to addresses
- Certain kinds of place names
- Any coordinate format that Gmap4 understands (WGS84 datum).

Pressing Enter after typing in the search bar is the same as clicking List.

If there is only one hit in response to your search, then pressing Enter will display the map instead of displaying a list (since the list only contains one hit).

If you click the 'Search & Mark' or 'Search' button, then you will see a map based on the **first item in the list of hits**. If you searched on a coordinate, then clicking one of these buttons will take you right there since the location of the coordinate will always be the first item in the list of hits. However, if you searched on a **place name** then the first item in the hit list may or may not be what you were searching for. Maybe the item you were searching for is #3 on the list of hits, or #4 or....

If you click an item in the list of hits then the map will center at that spot.

In response to your search request, the map will automatically resize to contain all the markers that you ask to have placed on the map. If you rest the cursor briefly on a marker then you will see the same text that is shown in the list of hits.

If you are looking at a topographic map when you ask to have your search results displayed on a map, then the map will change to the Google Terrain view if (1) any marker on the map lies outside of the USA-Canada combined or (2) the map has to zoom out to zoom level 9 or less in

order to include all the markers you requested. (To find out the current zoom level, right-click the map.)

a. Searching addresses

Gmap4 sends your search request to Google where it is processed by a geocoder. Hopefully this geocoder sends back one or more coordinates. Since Google's geocoder performs a **special type of search** you will have better results if you experiment with it a bit by trying different searches and looking at the list of hits. Gmap4 shows you all the 'hits' that are returned by Google's geocoder.

Here is a statement from Google about searching on addresses:

> "Generally, addresses are returned from most specific to least specific; the more exact address is the most prominent result..... Note that we return different types of addresses, from the most specific street address to less specific political entities such as neighborhoods, cities, counties, states, etc."

b. Searching place names

Here is a quote from a Google document that sheds light on the kinds of place names that should be searchable:

- "street_address indicates a precise street address.
- route indicates a named route (such as "US 101").
- intersection indicates a major intersection, usually of two major roads.
- political indicates a political entity. Usually, this type indicates a polygon of some civil administration.
- country indicates the national political entity, and is typically the highest order type returned by the Geocoder.
- administrative_area_level_1 indicates a first-order civil entity below the country level. Within the United States, these administrative levels are states. Not all nations exhibit these administrative levels.
- administrative_area_level_2 indicates a second-order civil entity below the country level. Within the United States, these administrative levels are counties. Not all nations exhibit these administrative levels.
- administrative_area_level_3 indicates a third-order civil entity below the country level. This type indicates a minor civil division. Not all nations exhibit these administrative levels.
- colloquial_area indicates a commonly-used alternative name for the entity.
- locality indicates an incorporated city or town political entity.
- sublocality indicates an first-order civil entity below a locality.
- neighborhood indicates a named neighborhood.
- premise indicates a named location, usually a building or collection of buildings with a common name

- subpremise indicates a first-order entity below a named location, usually a singular building within a collection of buildings with a common name
- postal_code indicates a postal code as used to address postal mail within the country.
- natural_feature indicates a prominent natural feature.
- airport indicates an airport.
- park indicates a named park.
- point_of_interest indicates a named point of interest. Typically, these "POI"s are prominent local entities that don't easily fit in another category such as "Empire State Building" or "Statue of Liberty"."

Source: https://developers.google.com/maps/documentation/geocoding

c. Searching coordinates

Gmap4 supports searching on the following types of coordinates. In order to get correct results, the coordinates must be in the WGS84 datum.

- Latitude longitude
  - decimal degrees (dd.dddddd)
  - degrees and decimal minutes (dd mm.mmm) <== Popular for geocaching
  - degrees minutes seconds (dd mm ss)
- UTM - Universal Transverse Mercator
- USNG - U.S. National Grid (Standard for federal search and rescue missions)
- MGRS - Military Grid Reference System

Most reasonable ways to write coordinates will work.

If you search on UTM, USNG or MGRS then the coordinate format will be changed to the same type of coordinate you used in your search. Also, a coordinate grid will be displayed.

If you search on a coordinate and then look at the '**list**' of hits, the first item in that list will place a marker at that exact coordinate. The other items in the list were generated by Google's geocoder. Google states:

> "Reverse geocoding is an estimate. The geocoder will attempt to find the closest addressable location within a certain tolerance; if no match is found, the geocoder will return zero results."

i. Searching on latitude longitude coordinates

Latitude longitude coordinates west of the principal meridian (includes North America and South America) must have a longitude that is either negative or marked with an W. Coordinates east of the principal meridian must have a longitude that is either positive or marked with an E. Coordinates south of the equator must use a minus sign or S with the latitude.

Coordinates must be balanced. If your latitude is degrees minutes seconds then your longitude must also be degrees minutes seconds even if the seconds are zero.

Allowable formats for searching on latitude longitude coordinates include the following.

Decimal degrees

- 48.111962,-121.115385
- N48.111962 W121.115385
- 48.111962N,121.115385W

Degrees and decimal minutes

- N 48° 6.718' W 121° 6.923' <== Popular geocaching format
- N 48 6.718 W 121 6.923 <== Popular geocaching format

Degrees minutes seconds

- 48° 6' 43" -121° 6' 55"
- 48d 6m 43s -121D 6M 55S
- 48 6 43 -121 6 55
- 48:06:43-121:06:55

ii. Searching on UTM coordinates

Note that you do need to include the UTM zone in your search. The UTM zones are numbered 1 through 60.

Gmap4 uses **latitude bands** as part of UTM coordinates. The USA is in latitude bands R, S, T and U.

Allowable formats for searching on UTM coordinates include the following.

- 11S 384381 4048885
- 11S 384381,4048885

iii. Searching on USNG or MGRS coordinates

Since both USNG and MGRS coordinates specify an area or box, the map will be centered at the center of that box.

Allowable formats for searching on either USNG or MGRS coordinates include:

- 10T grid zone
- 10T ET 100,000 meter box
- 10T ET 4 7 10,000 meter box
- 10T ET 49 72 1,000 meter box

- 10T ET 496 723 — 100 meter box
- 10T ET 4962 7237 — 10 meter box
- 10T ET 49622 72376 — 1 meter box

- 10T,ET,496,723 — 100 meter box
- 10T_ET_496_723 — 100 meter box
- 10TET — 100,000 meter box
- 10TET47 — 10,000 meter box
- 10TET4972 — 1,000 meter box
- 10TET496723 — 100 meter box
- 10TET49627237 — 10 meter box
- 10TET4962272376 — 1 meter box

Note - Since the earth is more-or-less round, some of these grid boxes are not full size. In this case the map will still be centered as though the grid box is full size. If (1) the grid box you search for is not full size and (2) the map is centered outside of the grid box you searched for, then you will see a warning message.

9. Tips for iPhone - Landscape mode - Full screen

Here is a tip for people that use an iPhone and the Safari browser to look at Gmap4 maps.

In landscape mode Safari shows a white bar with various symbols at the top and bottom of the screen. The bottom bar hides the Gmap4 controls that let you access the Menu and also change the basemap. In iOS 9 (and maybe some earlier versions) the 'Settings' do not provide any way to hide these white bars. This is widely viewed as a bug in Safari or at least a case of very user-unfriendly design by Apple.

Here is one way to **make Safari full screen in landscape mode**.
1. Open the Gmap4 map you want to look at
2. Orient the phone to portrait mode
3. Open bookmarks
4. Orient the phone to landscape mode
5. Close bookmarks

Safari is now full screen in landscape mode. If you touch near the bottom of the screen then the two white bars come back.

10. Tips for GIS overlays

Gmap4 can display a vast amount of data as transparent overlays on top of any basemap. This type of data is hosted on GIS (Geographical Information System) servers most of which are operated by governmental agencies from federal to local. Gmap4 displays this data directly from

the GIS server to you. **Anyone willing to read and follow some simple directions can make a Gmap4 link to display the GIS data they want to see.**

To display the list of available GIS overlay layers, click the button that always displays the name of the current basemap. The basemap button is next to the "Menu" button.

Desktop/laptop: When you click the basemap button two drop down menus appear labeled "Overlays" and "Basemaps".

Mobile: After touching the basemap button, scroll down for the "Overlay" section.

Four GIS overlays are hard coded into Gmap4:

- **USA weather radar.** This overlay looks the best when the map is **zoomed out**. If there is a big weather event happening then the federal server hosting the radar data can become slow.

- **Google traffic.** Technically, this overlay data is not coming from a GIS server but instead is coming from Google's servers.

  Here is a link for **mobile users**. This link will start Gmap4 and display the Google aerial and the Google traffic information. The traffic information will update every 3 minutes. Since this link also turns on Gmap4's geolocation feature, the symbol at the center of the screen will follow you as you travel.
  https://mappingsupport.com/p/gmap4.php?t=h,**Google_traffic&mylocation=on**

- **Congress house districts.** If you turn this overlay layer 'on' and see solid colors, then zoom in. The solid colors will go away and you will be able to see the district lines very easily. If you click a district then you will see a popup with all the attribute data the GIS server has for the thing that you clicked. Anyone can easily make their own custom Gmap4 link that will have the congress overlay turn on when the map opens and also highlight the boundary of one district. For more information, please turn on the congress overlay and then click "Map Tips" in the upper left corner.

- **USA contour lines (except Alaska).** Many people enjoy seeing the contour lines on top of the Google aerial.

To turn a GIS overlay layer on or off, click it. A layer that is 'on' has a number by its name. A higher numbered layer is 'on top' of any lower numbered layers. To move a layer that is on up to the top of the stack, turn that layer off and then back on.

You can click most GIS symbols and a popup will appear with all the attribute data the GIS server has for the thing that you clicked. **Being able to see all the attribute data is one of the best things about working with GIS data.** Some GIS layers have attribute fields that contain

links which lead to more information about the thing that you clicked. Be patient. Some GIS servers will take a few seconds to respond.

Three things to keep in mind:

- You can only display attribute data for the GIS overlay layer that is 'on top', in other words, the layer with the highest number.

- When the popup is on the map (showing attribute data or a message) then you cannot click the portion of the map that is below the popup. You need to either close the popup or drag the map.

- When a Gmap4 map can show overlay layers in addition to the USA weather radar and contour lines, then you cannot doubleclick on the map to center the map at that spot. Doubleclick is disables so it does not interfere with the ability to do a single click and get GIS attribute data. To re-center the map you can do click-hold-drag.

To see just the GIS overlay layers that are 'on' without any basemap, change the basemap to "**All white basemap**". You can make some really interesting map views with this technique.

A growing list of Gmap4 map links that can display GIS basemaps and GIS overlay layers, including attribute data, can be found at
https://propertylinemaps.com/p/public_land_map.html.
If you do not see your state yet, more states will be added as time allows.

For plenty of example maps and plain language instructions, please see:
GIS Viewer page: https://mappingsupport.com/p/gmap4-arcgis-layers-on-google-maps.html
GIS Help page: https://mappingsupport.com/p/gmap4_gis_help.html

11. Tips for mobile users and the "My location" feature

If you are going to use this feature then be sure to turn on the GPS feature in your smartphone or other mobile device.

When you start the 'My location' feature, your browser might ask you for permission to share your location. That permission only applies to the Gmap4 program. Gmap4 does not save your location or share it with anyone. The only thing Gmap4 does with your location is show it on your screen. You can use your browser's settings to cancel that permission at any time.

The position of the red circle on the map is automatically updated as you move. This update happens at least once every 5 seconds.

When you touch the location symbol the **current coordinate format** is use to display your position. The coordinate formats are dd.dddddd (default), dd mm.mmm, dd mm ss, UTM,

USNG and MGRS. If you change the coordinate format (via the Menu button) then the next time you touch the location symbol the new coordinate format you selected will be used to show your location.

There are **two ways** to use the "My location" feature.

First, if you are using a smartphone, tablet or other mobile device and touch Menu ==> "My location" then Gmap4 will use the geolocation feature **provided by your browser** to try and center the map at your position. If your mobile device has a GPS chip and the GPS is on and you give permission, then your browser will use the GPS satellites to help determine your position. Your browser might also use one or more of: your IP address, cell towers, RFID, WiFi and/or Bluetooth.

Second, adding &mylocation=on to a Gmap4 link will automatically show your location when the map opens in your browser.

Remember, it is **your mobile browser** that determines your location. **Your browser** then filters that location data in strange, mysterious and largely undocumented ways before sending location coordinates to Gmap4. No doubt different browsers, and different versions of the same browser, work differently in this regard. All Gmap4 does is display a red circle at your location as determined by your browser software.

If you touch the location symbol (red circle) then a popup appears that shows the coordinates at the center of the symbol and an 'accuracy' distance. There is supposed to be a 95% probability that your true location is within that distance of the coordinates that are displayed.

Caution - The GPS in your smartphone or other mobile device might only be accurate to about **50 feet**! For more details, keep reading.

Let us assume that your smartphone has a GPS chip and you have a GPS app on your phone and you are in a remote area where there are not any cell towers or WiFi. (Of course Gmap4 will not work on your phone at this location since you cannot get online.) If your smartphone (or tablet, etc) does not have one of the following technologies, then the best location accuracy your phone will give you is about **50 feet** (~15 meters).

- **WAAS** - This technology corrects the GPS data from the satellites for various problems including those caused by the data stream passing through the ionosphere and atmosphere. **Bad news:** Smartphones, tablets and other mobile devices do not have this technology! Also, this technology only covers the USA. (Handheld GPS units do have WAAS.)

- **GLONASS** - This technology is Russian GPS satellites. Many (but not all) smartphones and other mobile devices can receive data from both the USA satellites and the GLONASS satellite. If your mobile device can receive data from both types of satellites then in good conditions your location accuracy should be around 15 feet (~4.5 meters).

The iPhone 4s and newer models include GLONASS. For Android devices you can consult your user manual or you could check this list:
https://en.wikipedia.org/wiki/List_of_smartphones_using_GLONASS_Navigation

You can test the location accuracy of the GPS in your smartphone or other mobile device. You need an app that lets you record your track and then email that track to yourself as either a KML or GPX file. Gaia GPS is a popular app which works on both Apple and Android devices. Here are the steps:

1. Load the Gaia GPS software and learn how to use it to record your track.
2. Walk somewhere that you can see on the google aerials. This could be along a sidewalk or on a marked line around a sports field or any other line-of-travel that you can see on the google aerial.
3. Email your track to yourself as either a GPX or KML file.
4. Open that email on your computer and save your file.
5. Place your file online.
6. Make a Gmap4 link to display your file.
7. Compare the location data produced by the GPS chip in your device to the real location of where you walked as shown on the google aerial.

If you need help placing your file online or viewing your file with Gmap4 then please visit the Gmap4 Help page and download the pdf file "Working With Files".

Note - **Native apps** like Gaia are different than Gmap4 when it comes to determining your location. Native apps only rely on the GPS chip for location data. **Browser apps** like Gmap4 get their location data from the browser software. Your mobile browser determines your location by using the GPS chip plus one or more of your IP address, cell towers, RFID, WiFi and/or Bluetooth.

12. Tips for embedding Gmap4

Please do not embed more than one Gmap4 map on a webpage.

The feature Menu ==> "Embed this map" will display the html code for making an iframe that is 500 pixels by 500 pixels. Gmap4 is designed to work correctly and look good down to a size of 400 by 400.

When using Gmap4 in an iframe, a good practice is to include a link below the iframe that will display the same map full screen. That link is included in the html code that is displayed.

You may need to tweak this html code so it looks good on your site.

13. Tips for using directions

There are two ways to get turn-by-turn directions.

First, you can rightclick the map and then click one of the buttons at the bottom of the popup.

Second, mobile users can turn on geolocation (Menu ==> My location) then tap the location symbol then tap the directions button. The start of the trip will be your current location.

One end of your trip is filled in with coordinates using the **current coordinate format**. The other end of your trip can be an address, placename, **USNG coordinates** or any other coordinate format that Gmap4 understands.

The blue line that appears on the map is draggable and the turn-by-turn directions will update accordingly.

If you get directions with a cell phone or tablet and also turn on Gmap4's geolocation feature (Menu ==> My location), then the symbol showing your location will follow the blue line on the map as you drive that route.

14. Printing

If you need a high quality printed waterproof topographic map please consider ordering one from https://mytopo.com. After all, the Trimble company (they own MyTopo) allows Gmap4 (as well as other software) to show you the MyTopo topographic maps online at no cost. We should return the favor by giving them our business when we need to purchase paper maps.

You can print maps, including topographic maps, right from your browser. None of the Gmap4 code is involved in this process. This is all handled by Google's code and your browser.

Note - If your map had the Gmap4 search bar open then you might need to close that search bar before trying to print.

In Firefox and IE, click File ==> Print Preview. A preview screen should appear that shows some controls at the top and all or part of your map. Use those controls to:
1. Display the map in landscape mode
2. Adjust the print scale so the map nicely fills the page

If you want the current magnetic declination to appear on the printed map then click Declination. The declination will appear in the lower left corner.