

Guide to using Google Earth

Introduction

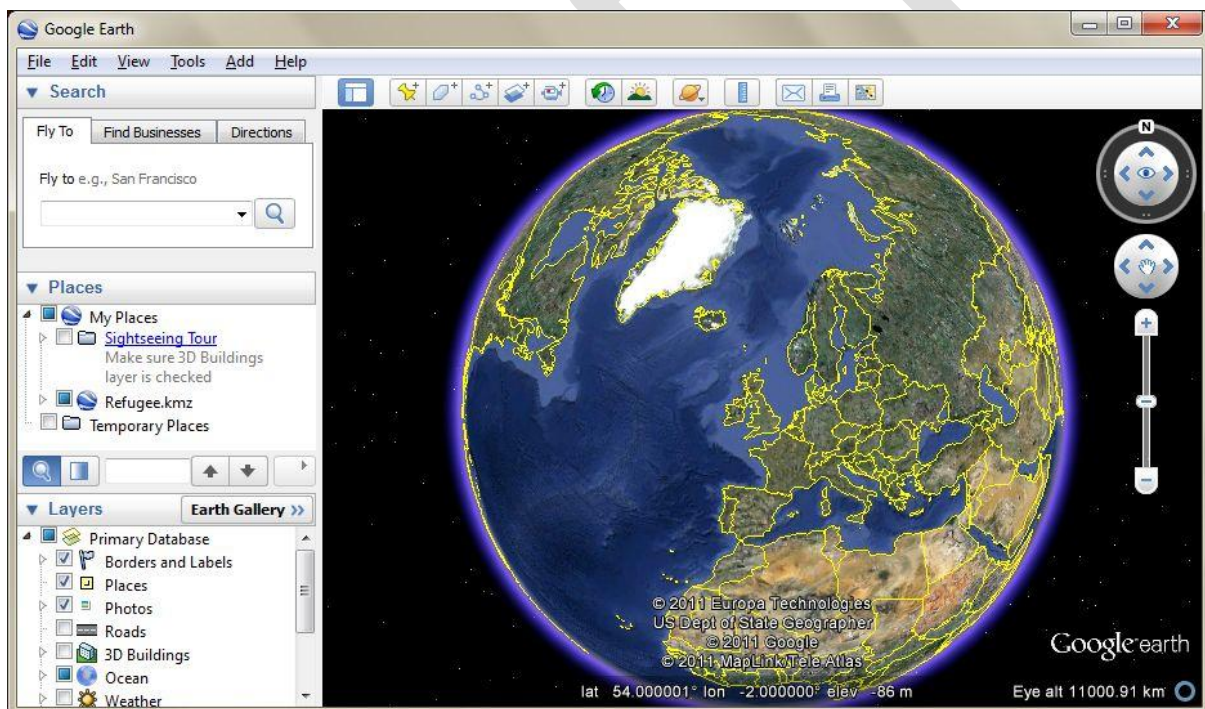
Google Earth is freeware that allows users to view images of the Earth and to overlay their own data on top. It builds in the simple functionality of web-based sites such as Google Maps and Street View.

While only having simple mapping capabilities it allows users to mark points, lines and areas (polygons) using a limited set of symbols. When used in public health this allows users to map service providers, cases of disease, operational areas and administrative boundaries.

Google Earth can be used both on and off-line (see section below).

Simple functions

The Google Earth window is made up of sections:



The left hand side is the legend and is used to control what data is shown, to find locations, and to manage “user” data. The main section of the window shows the image data, with zooming tools on the far right. The menu across the top provides the additional functionality.

The best way to start is get used to zooming in and out, moving around and finding locations.

Zooming in / out and panning

If you have a mouse with a roller / wheel, you can use this to zoom. If not then you can use the buttons on the right hand size



You can click on the + and – to zoom in increments, or slide the central bar up or down to zoom in and out more quickly.

Once you have zoomed in, you can move around, or pan, by moving the cursor over one side of the map, holding down the right mouse button and then move it. When you release the mouse button your map will re-draw.

If you release the button while the cursor is moving the map will continue to move. This allows you to pan across larger areas without continuously having to click and move. To stop the map from panning right-click on the mouse.

It is worth trying to zoom in and out and panning around to get used to it before continuing.

Image resolution and date

Google earth is made up of a collection of images. You will see different images depending on how much you zoom in. In some areas there are very detailed images allowing you to see individual buildings, in others these detailed images will be missing.

Images are added to Google Earth as Google decide they are needed, this means some images can be very out of date, while others, particularly around areas that have suffered a natural disaster, may be more recent.

You can usually find the image date and the source of the image listed at the bottom of the image.

Layers

Alongside the images there are additional layers that you can add to the image. These are listed on the left hand side in the window labelled 'Layers'. There are checkboxes next to each layer allowing you to add and remove them. The available layers will vary by location.

Moving to specific location

The search section on the left hand side allows you to find a village or town or move to coordinates you already know. The most straightforward way is to type in coordinates you already know. These must be in latitude and longitude. Depending on the format of your coordinates you type them in as follows

51.494175N, 0.009477E

51 32.65333N, 0 10.2222E

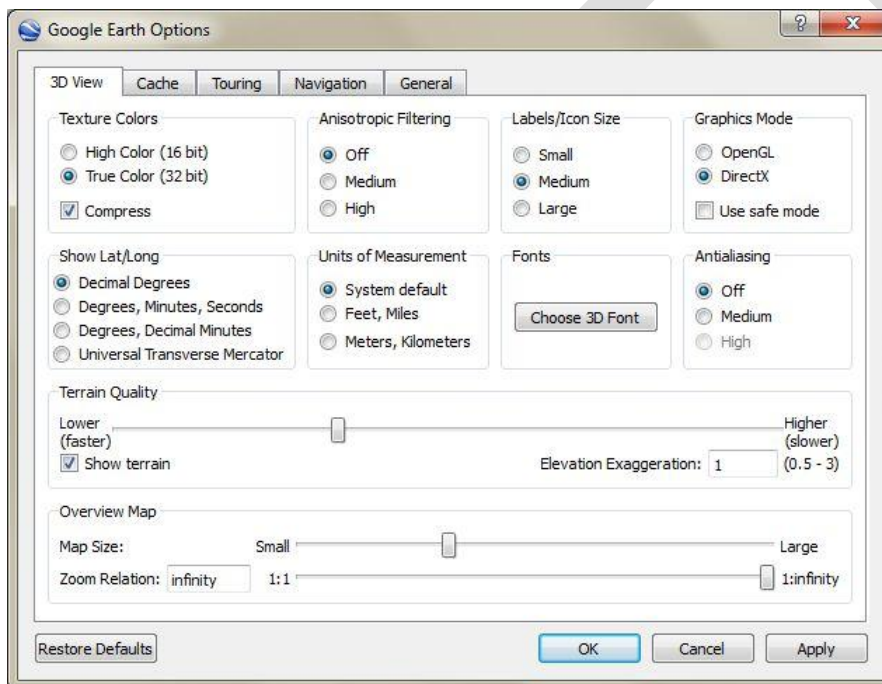
51 32 43.28333N, 0 10 30.32333E

If you do not have a coordinate you can type the village/town name into the search box. Not all villages will be found, and you may have to select the correct village from the list of villages containing that name. This method will work better in some countries compared with others. Different dialects can also cause problems as villages may be spelt differently.

Setting the Coordinate system

With all geographical data, it is vital you can define the coordinate system. With Google Earth there are limited things you can set, but you can specify how the coordinates are displayed, either as decimal degrees, or degrees and decimal minutes or degree, minutes and seconds.

You can set this using the options menu. In the menu select Tools, Options. The following menu will appear:



The best option to have selected is Decimal Degrees. Having done this click on 'Apply'

Now if you move your cursor over any point on the map the coordinate will appear in decimal degrees in the bottom right-hand corner of the window. This method can be used to find or check the coordinates of any point you can see on the map.

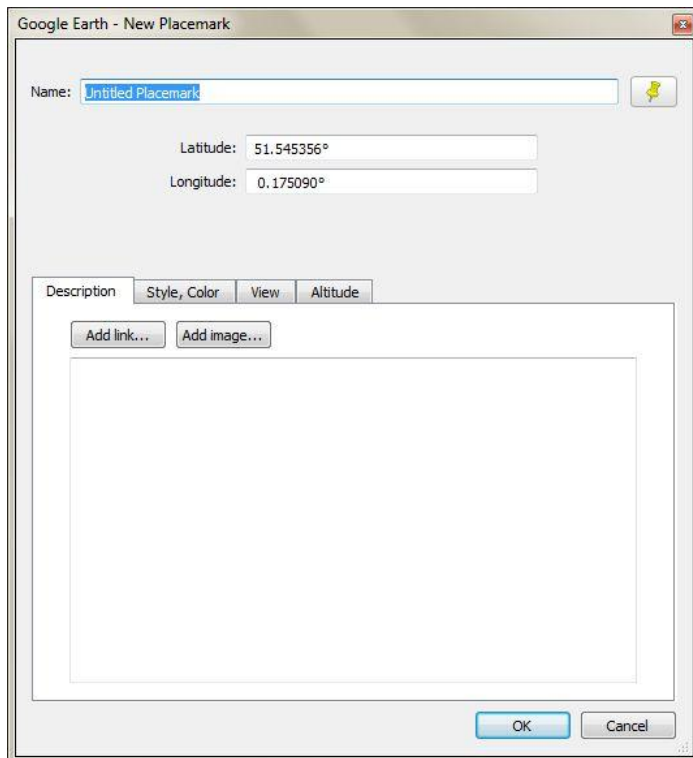
Marking and storing locations

It's possible to mark and store locations in Google Earth. The simplest method is to use placemarkers (points). The middle window on the left hand side is called 'My Places.' This is where the users' generated information is stored. When creating placemarkers they are added into this section. The difficult part to creating / marking locations is how to group them

together. Grouping data allows you to easily colour them and add / remove them from the screen.

Move your cursor over the text "My Places", right click and select 'Add' from the menu. In the second list select Folder. The Add Folder menu will appear into which you can add the folder name. It is best to give the folder a name that tells you what it contains, i.e. Clinics, cases, wells.

To add actual placemarkers, right click on the folder you created and select Add, then select Placemark. The New Placemark menu will appear



You can give this location a name. The coordinate listed is the centre of the map. You should also notice a cross marked on the map. You can move this to the required location, or if you have a coordinate already you can type this in. If you want each placemark to have a different symbol you can set this using the Style, Colour tab in this menu.

You can add as many placemarkers in this folder as you like. If you want them all to have the same symbol then you can right click on the folder name and select Properties. You can then select the Style, Colour option to set the symbol for all points in the folder.

When you exit Google Earth you will be asked if you want to save these locations, selecting 'Yes' will mean they are available next time you open the programme.

Create and working with KML / KMZ files

The placemarkers created in the previous section will be available each time you open Google Earth, but to move data between computers you need to use Google Earth's data format, KML, or KMZ (which are compressed files). These files can be moved around, emailed to others to use in Google Earth or other mapping softwares.

To create a new KML or KMZ file, right click on the folder you want to export and select 'Save Place As'. Make sure you save the file to somewhere obvious on your computer then give it a name.

To open a KML file select 'File' from the menu at the top of the screen, then select 'Open'. Move to the location you stored your KML file, then select the file and click on 'Open'. The data will be added to your view.

These files can be moved and emailed as you would a Word or Excel file.

Creating polygons

It is often useful to be able to add polygons or areas to your map. These are created in the same way as Placemarkers. It is possible to have both polygons and placemarkers (points) in the same folder, but it is better practice to keep them separate. The best way to do this is to create folders, putting points in one and polygons in another.

Create a new folder, then right click on this new folder and select 'Add' and then 'Polygon'. Initially the menu looks the same, you can set the name and symbol as for points. The difference is that you have to create the polygon. You do this by drawing the polygon on the map, i.e. click on each point that defines the outline / edge of the area. To close/finish the polygon you double click on the last point.

You will notice that initially the polygon is shaded a solid colour, you may want to set the filling to be clear, so you only have the outline of the area, or set it to be 50% transparent. Both these methods allow you to see the image as well.

Practice

Almost all the things you want to do with Google Earth build upon these simple steps. It is not possible to go further without understanding these basics. It is important to practice all of these until you can do them routinely. It is particularly important to get used to using folders to structure your own data to allow you to pick and choose what you draw, export etc.

Google Earth offline

It is possible to use Google Earth offline without a special licence. To use the software offline the programme must be opened while online and the area of interest viewed. The information is saved ('cached') on your computer so that the next time you open the software off-line, you can use Google Earth as usual. By default Google Earth remembers the last area you were viewing online

To insure the best quality/quantity of imagery in the memory to be used offline, follow these simple steps while online.

1. Setting up the "cache"

The cache is a temporary memory used to improve the performance of the computer

- a. Open Google Earth
- b. Go to Tools > Options
- c. Select the thumbnail "**CACHE**"
 - i. Set the **memory Cache size (MB)** to **1024** (it will automatically setup to the maximum that your computer configuration allows. Accept the

compromise if a pop-up window appears indicating the maximum cache allowance has been exceeded)

- ii. Set **Disk Cache size (MB)** to **2000**
- iii. Click Apply and OK

2. Creating the “cache”

- a. Zoom to one point on the edge of the area you want to visualize offline
- b. Slowly fly over the area you want to save, allowing time for Google Earth to display all the images properly (when the image is blurry, pause to allow Google Earth to download the whole “tile”)
- c. **Warning:** the cache will quickly fill up and will then automatically replace old information with new information but will not tell you! To reduce this risk, fly over sections of the area of interest for no longer than 1 minute
- d. Using the zoom will save different resolutions of the same area if needed
- e. **Warning:** the more you zoom in, the smaller the area you can save. However if you do not use the zoom when online, it will not work when offline. So you have to decide what resolution you need before while you are online!
- f. When you have completed the flyover of the area of interest, quit Google Earth
- g. If you do not use Google Earth online, the next time you open Google Earth offline you will be able to fly over the exact same area you just flew over
- h. **Warning:** if you use Google Earth online for another location, the last location used will be saved. To avoid losing the data for the first location, follow step 3.

3. Saving the cache / Saving several areas

- a. Go to Windows Explorer
- b. Go to Tools > Options
- c. In the thumbnail “view”, select “Show hidden files and folders”
- d. And deselect “hide extension for known file types”
- e. Click Apply and OK
- f. Then go to: C:\Documents and Settings\YOUR_USERNAME\Local Settings\Application Data\Google\GoogleEarth
- g. Create a folder here for the zone you want to save (e.g. *Chad_Zone1*)
- h. Find the files called:
 - i. **dbCache.dat**
 - ii. **dbCache1.dat**
 - iii. **dbroot_cache**
 - iv. **dbCache1.dat.index**
 - v. **dbCache.dat.index**
- i. Copy and paste these files into the folder (e.g. *Chad_Zone1*)

Now you can repeat steps 2 and 3 for different zones or for different parts of one large zone

Make sure you save the **dbCache** files (there should be 5 files) in a new folder with a new name (e.g. Chad_Zone2, Chad_Zone3 etc) each time.

To look at the zone when offline you will have to copy and paste the dbCache files to the following location: C:\Documents and Settings\YOUR_USERNAME\Local Settings\Application Data\Google\GoogleEarth

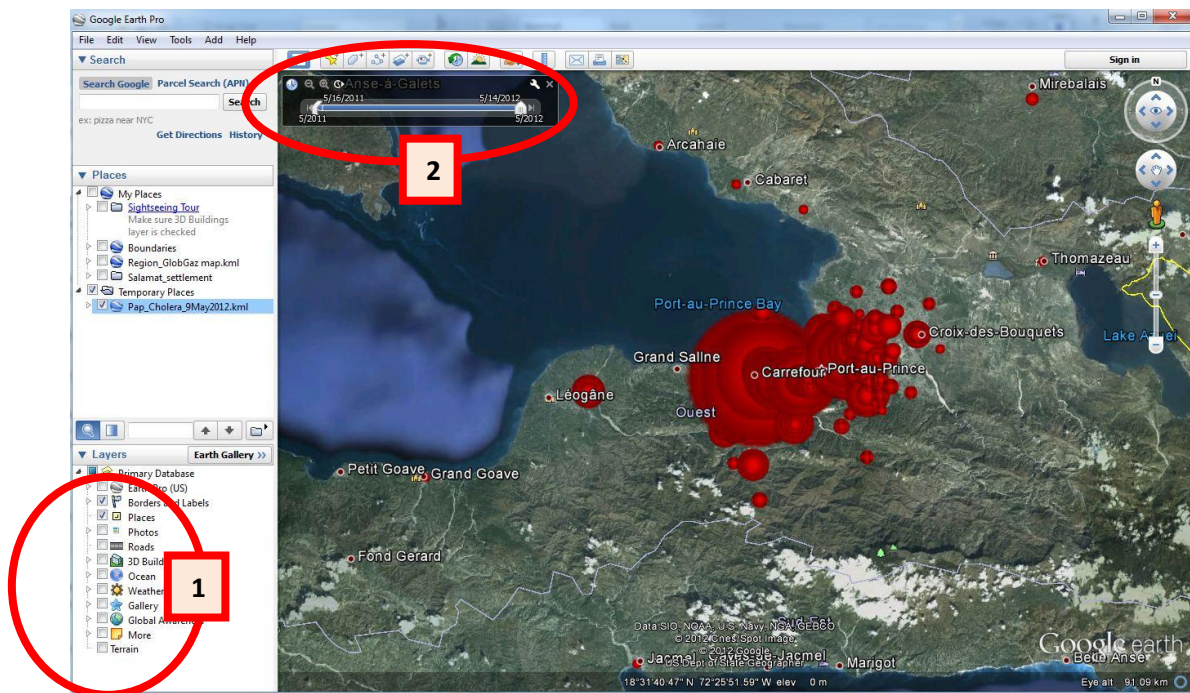
Clicking YES to the popup windows "Do you want to replace the existing file with this file"

And every time you need to look at a new zone you will have to replace the 5 dbCache files with the ones you have previously saved in another folder (e.g. *Chad_Zone2*)

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Opening a KML file

Double click the KML file (the example Pap_Cholera_9May2012.kml is shown here)



1. To make it more readable, you can remove unnecessary labels by deselecting default layers such as “Borders and Labels” or “Places”
2. Set the **Time slider**: its default setting on opening is to display all the information included between the first and the last date it finds in the dataset (kml file); to change it to focus on just one day at the time, follow these 4 steps:
 - a. Take the **right cursor** and drag it to the centre (see image below)
 - b. Take the **left cursor** and drag it as close as possible to the right cursor
 - c. Select the right cursor. You will now be able to drag both cursors to the left side of the time slider. The cursors will now stick together during the animation
 - d. Click the **Run** animation button



3. You can now select a certain period of time by moving both cursors together along the time slider to the date you require.