

An Introduction to Google Earth and Google Maps

[Google Earth](#) and [Google Maps](#), two geospatial products offered by Google Inc. Google Earth exist as both a stand-alone application available for [download](#) (for PC, Mac and Linux) as well as a [plugin](#) for Google Chrome that enables seamless transition to the web-based Google Maps. The two are closely integrated and in many cases present the same data. Google Earth has three-dimensional representation of the planet composed of [satellite](#) and aerial photographs of its surface. It is akin to an interactive, digital globe with updates of new imagery, including terrain relief, [three-dimensional buildings](#) in major cities and an abundance of [user-generated content](#). In contrast, the default presentation in the web-based Google Maps is more of street map application with a focus on navigation, way finding and presenting location information for places and businesses. The exercises accompanying the following chapters will focus on Google Earth Pro as it includes powerful features enabling the overlay of images, data and information on existing imagery. Google Earth's ability to view [historical imagery](#) allows us to see landscape change over time and the spatial representation of the different interpretations of geography featured in this text-book.

Resources:

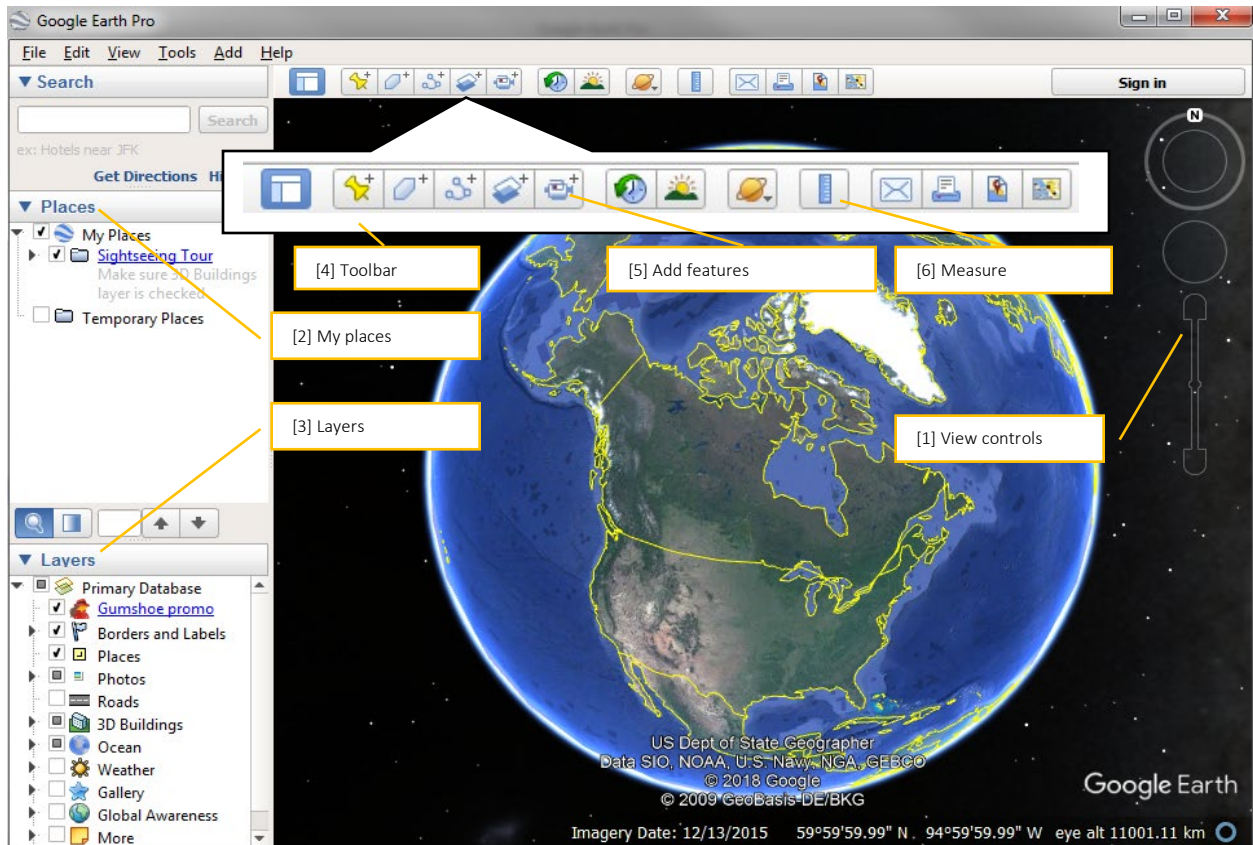
[Google video tutorials](#)

Using Google Earth

Below is Google Earth as seen at startup. The interface is simple and invites exploration – hovering your mouse over any element will bring up a description of its function. Use the mouse to manipulate the three-dimensional globe and to change zoom levels. All movement and camera angle controls are duplicated in the top right of the viewport [1]. By default, the view is perpendicular to the surface of the earth, with one's elevation indicated in the bottom right of the interface. Zooming in very close to the surface will tilt the view to reveal 3D topography and relief. Hold down the right mouse button for zooming and panning functions. You can reset the angle and orientation via the view menu in the top toolbar.

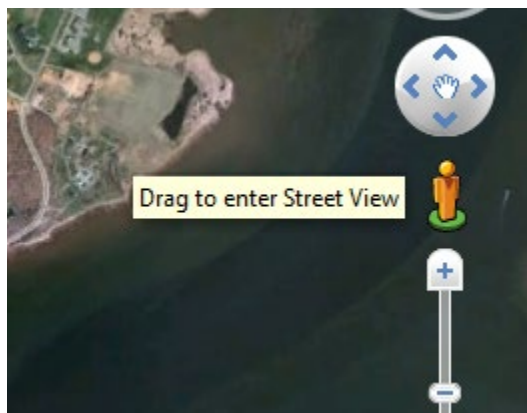
A key strength of Google Earth is the ability to superimpose information on top of the base map. Data accompanying the text chapters and from your own explorations on the web will appear in the 'Places' sidebar [2] on the left menu. For full-screen viewing the sidebar can be disabled with the left most button on the toolbar, [4] on the top menu. Below the places sidebar are Google Earth's built-in data layers [3], including 3D buildings (currently available in most major cities), geo-referenced photos, political boundaries, roads, and several thematic layers including weather, global events, natural phenomena and others as selected by Google staff. All layers, including those you add yourself, can be turned on and off at will.

The toolbar also contains five tools enabling users to add their own content [5]. Here you can add [place marks](#) to describe single point features, [shapes or polygons](#) to define an area, lines, [image overlays](#), or even a recorded sequence of zoom levels and angles to create a tour of your area of interest. Google provides a startup guide on these and other features at their [help site](#). These features serve as a rudimentary geographic information system or GIS, making Google Earth a powerful spatial tool particularly when combined with the multitude of publically available data and crowd sourced material on the web. Google Earth Pro is now also available for free so you are also able to add your own spatial data in the commonly used ArcGIS format, import and georeference spreadsheet data and save high resolution images.



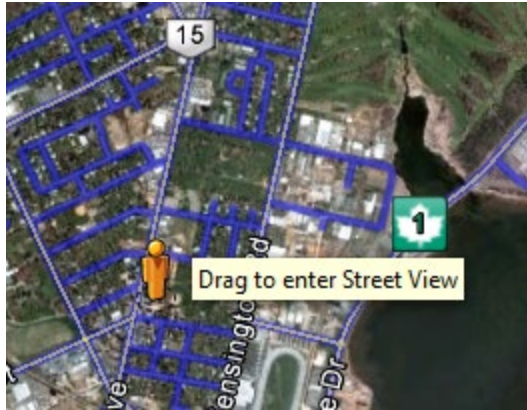
Useful Features

In the exercises accompanying the chapters of the textbook, we will use a range of Google Earth's features. Below is a description of some of the more useful ones:



Street View:

Zooming in sufficiently enables the street view icon alongside the viewport controls in the top right.



You can drag and drop the icon onto streets in North America, Europe and some other parts of the world. This will show you the same street view you would see in Google Maps on the web.



Figure 1: Sunlight toggle (red); ruler (green); path tool (yellow)

Terrain Relief:

For viewing terrain you may find the sunlight feature useful [Fig. 1]. You can control the time of day using the feature above. It is very effective for showing relief, particularly in areas where the landscape has subtle elevation changes.

Ruler, Paths + Elevation Profiles:

Two icons to the left is the ruler tool, which can be used to measure linear distances in a variety of units directly from the map.



Figure 2: Ruler tool

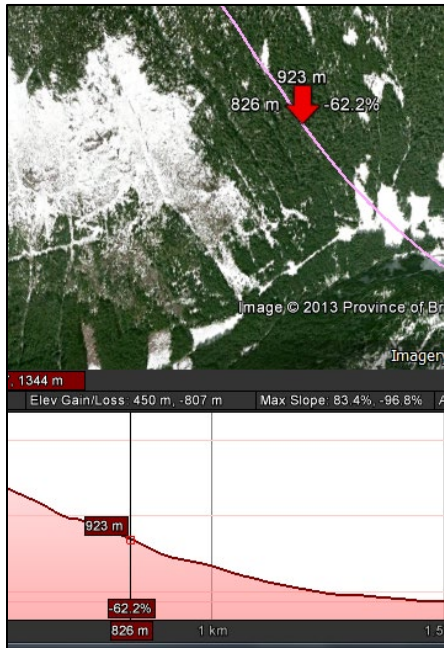


Figure 3: Elevation profile of a path

If you chose to save your measured distance as a path, right clicking that object in your “My Places” sidebar brings up the elevation profile (right click > show elevation profile)—enabling you to view the elevation change and exact location of each elevation value along the path. You can do the same for other paths, including non-linear ones such as GPS tracks.

Google Maps:

The transition to Google Maps can be made from within Google Earth by clicking this icon on the toolbar:



You can also visit the site [directly](#).



Though slightly different, the interface will be familiar to those using Google Earth. Street view and navigational controls are on the left side of the interface, and Google Earth adds the ability to display live or historical traffic data as well as bicycle routes and transit information in select cities. The view can be toggled between the standard street map style above, the satellite view or even embedded Google Earth plugin. Google Maps also adds the ability to get 'turn by turn' directions for pedestrians, transit users, drivers or cyclists.