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Getting Started



This user guide describes Google Earth Version 4. [View documentation for Version 3.x or earlier.](#)

Welcome to Google Earth! Once you [download](#) and [install](#) Google Earth, your computer becomes a window to anywhere on the planet, allowing you to view high-resolution aerial and satellite imagery, elevation terrain, road and street labels, business listings, and more.

See [Five Cool, Easy Things You Can Do in Google Earth](#).

Use the following topics to learn Google Earth basics - navigating the globe, searching, printing, and more:

- [Getting to know Google Earth](#)
- [New features in Version 4.0](#)
- [Navigating in Google Earth](#)
- [Finding places and directions](#)
- [Marking places on the earth](#)
- [Showing or hiding points of interest](#)
- [Tilting and viewing hilly terrain](#)
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For other topics in this documentation, see the table of contents (left) or check out these important topics:

- [Making movies with Google Earth](#)
- [Using layers](#)
- [Using places](#)
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Getting to Know Google Earth

The following diagram describes some of the features available in the main window of Google Earth:

[Touring Places](#)

[Editing Places and Folders](#)

[Managing Search Results](#)

[Measuring Distances and Areas](#)

[Drawing Paths and Polygons](#)

[Using Image Overlays and 3D Models](#)

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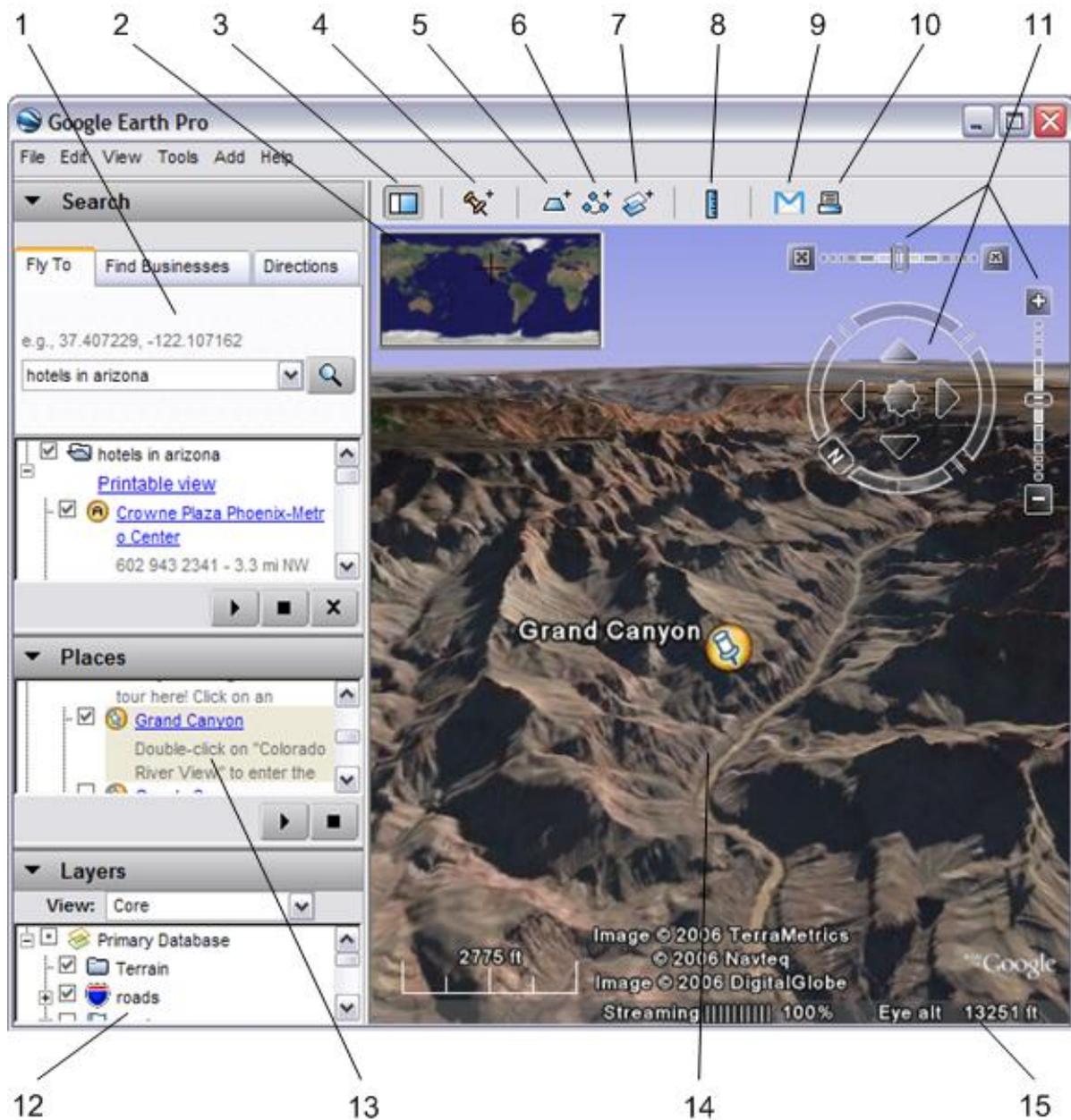
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1. **Search panel** - Use this to [find places and directions](#) and [manage search results](#).
2. **Overview map** - Use this for an [additional perspective](#) of the Earth.
3. **Hide/Show sidebar** - Click this to conceal or the display the side bar (Search, Places and Layers panels).
4. **Placemark** - Click this to add a [placemark for a location](#).
5. **Polygon** - Click this to [add a polygon](#).
6. **Path** - Click this to [add a path \(line or lines\)](#).
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8. **Measure** - Click this to [measure a distance or area size](#).
9. **Email** - Click this to email a [view](#) or [image](#).
10. **Print** - Click this to print the current view of the Earth.
11. **Navigation controls** - Use these to tilt, zoom and move around your viewpoint ([see below](#)).
12. **Layers panel** - [Use this to display points of interest](#).

13. **Places panel** - Use this to [locate, save, organize and revisit placemarks](#).
14. **3D Viewer** - View the globe and its terrain in this window.
15. **Status bar** - View coordinate, elevation and imagery streaming status here.

Five Cool, Easy Things You Can Do in Google Earth

Want to jump in and start having fun with Google Earth? Try any of the the following:

1. **View an image of your home, school or any place on Earth**

- Click *Fly To*. [Enter the location in the input box](#) and click the *Search* button. In the search results (Places panel), double click the location. Google Earth flies you to this location.



Search button

2. **Go on a tour of the world** - In the Places panel, check the *Sightseeing* folder and click the *Play Tour* button:



3. **Get driving directions from one place to another and fly (follow) the route** - See [Getting Directions](#) and [Touring the Route](#).

4. **View other cool locations and features created by other Google Earth users** - In the Layers panel, check *Community Showcase*. Interesting placemarks and other features appear in the 3D viewer. Double click these points of interest to view and explore. See [Using Points of Interest \(POIs\)](#) for more information.

5. **View 3D terrain of a place** - This is more fun with hilly or mountainous terrain, such as the Grand Canyon. Go to a location (see number 1 above). When the view shows the location, use the tilt slider to tilt the terrain. See [Using the Navigational Controls](#) and [Tilting and Viewing Hilly Terrain](#) for more information.



Tilt slider

New Features in Version 4.0

This version of Google Earth has a number of exciting new features, including:

- Compatibility with Linux
- French, German, Italian, Japanese and Spanish versions
- Mac Plus and Pro versions
- [Easier-to-use navigation](#). This includes diagonal navigation (up arrow + left arrow simultaneously)
- Toolbar buttons
- [Integration with Google SketchUp](#)
- Improved menus with new names, locations and shortcuts
- [Time feature](#)
- [Improved printed driving directions with images](#)

- [Expanded printing features](#)
- High-resolution detail area (focus) across entire screen for computers with certain high quality graphic cards. See [Viewing Preferences](#).
- Folders with descendents in the Places and Layers panels can be checked, clear or partially checked
- Region based loading (level of detail)
- [KML 2.1](#)

Installing Google Earth

For information about installing Google Earth, visit the [Google Earth Support Center](#).

System Requirements

To use Google Earth on a Windows PC, you must have at least the following:

- Operating System: Windows 2000, Windows XP
- CPU: 500Mhz, Pentium 3
- System Memory (RAM): 128MB RAM
- Hard Disk: 400MB free space
- Network Speed: 128 Kbits/sec
- Graphics Card: 3D-capable with 16MB of VRAM
- Screen: 1024x768, "16-bit High Color" screen
- For better performance, see [Recommended Configuration](#).

To use Google Earth on a Mac, you must have at least the following:

- Operating System: Mac OS X 10.3.9 or later
- CPU: G3 500Mhz
- System Memory (RAM): 256MB RAM
- Hard Disk: 400MB free space
- Network Speed: 128 Kbits/sec
- Graphics Card: 3D-capable with 16MB of VRAM
- Screen: 1024x768, "Thousands of Colors"
- For better performance, see [Recommended Configuration](#)

To use Google Earth on a Linux computer, you must have at least the following:

- Kernel 2.4 or later
- glibc 2.3.2 w/ NPTL or later
- XFree86-4.0 or x.org R6.7 or later
- CPU: 500Mhz, Pentium 3
- System Memory (RAM): 128MB RAM
- Hard Disk: 400MB free space

- Network Speed: 128 Kbits/sec
- Graphics Card: 3D-capable with 16MB of VRAM
- Screen: 1024x768, "16-bit High Color" screen

Note that Google Earth may work on other configurations not explicitly listed here. The recommended configuration for Linux computers:

- Kernel 2.6 or later
- glibc 2.3.5 w/ NPTL or later
- x.org R6.7 or later

Google Earth has been tested on the following GNU/Linux distributions, but certainly works on others:

- Ubuntu 5.10
- Suse 10.1
- Fedora Core 5
- Linspire 5.1
- Gentoo 2006.0
- Debian 3.1
- Red Hat 9

Please make sure your system has properly-configured OpenGL drivers. If Google Earth appears to be slow and unresponsive, it is likely that your system needs different video drivers.

Additional Support

In addition to this user guide, Google offers a number of resources that can help you use and enjoy Google Earth. These include:

- [FAQs](#): View a list answers to frequently asked questions (FAQs) about Google Earth.
- [Google Earth Help Center](#): Use the Help Center at any time to find additional information.
- [Troubleshooting](#): View information that specifically pertains to troubleshooting issues with Google Earth.
- [Google Earth Community](#): Learn from other Google Earth users by asking questions and sharing answers on the Google Earth Community forums.

Navigating in Google Earth

In Google Earth, you see the Earth and its terrain in the *3D viewer*. You can navigate through this 3D view of the globe in several ways:

- [Using a mouse](#)
- [Using the navigation controls](#)

You can also manipulate your view of the earth by [tilting the terrain](#) for perspectives other than a top-down view. Finally, you can [reset the default view](#) for a north-up, top-down view wherever you are.

Using a Mouse

To get started navigating with your mouse, simply position the cursor in the middle of the 3D viewer (image of the earth), click one of the buttons (right or left), move the mouse and note what happens in the viewer. Depending upon which mouse button you press, the cursor changes shape to indicate a change in behavior. By moving the mouse while pressing one of the buttons, you can:

- Drag the view in any direction
- Zoom in or out
- Tilt the view (requires middle button or scroll wheel)
- Rotate the view (requires middle button or scroll wheel)

The following list describes all the actions you can accomplish using the mouse.

- **Move the view in any direction (north, south, east, or west)** - To move the view, position the mouse cursor on the viewer and press the LEFT/main mouse button.

Notice that the cursor icon changes from an open hand  to a closed hand . Pull the viewer as if the hand cursor is like a hand on an actual globe, and you want to drag a new part of the earth into view.



You can drag in any direction to reveal new parts of the globe, and you can even drag in circular motions.

- **Drift continuously across the earth** - If you want to drift continuously in any direction, hold the left/main mouse button down. Then, briefly move the mouse and release the button, as if you are "throwing" the scene. Click once in the 3D viewer to stop motion.
- **Zoom in** - There are a number of ways to zoom in with the mouse.

- You can double-click anywhere in the 3D viewer to zoom in to that point. Single-click to stop, or double-click to zoom in more.
- If your mouse has a scroll wheel, use it to zoom in by scrolling towards you. Use the ALT (alt/option on the Mac) key in combination with the scroll wheel to zoom in by smaller increments. [More settings](#).
- You can also position the cursor on the screen and press the RIGHT mouse button (CTRL click on the Mac). Once the cursor changes to a double arrow, move the mouse backward or pull toward you, releasing the button when you reach the desired elevation.

If you want to zoom continuously in, hold the button down and briefly pull the mouse down and release the button, as if you are "throwing" the scene. Click once in the viewer to stop the motion.

- On some Macintosh laptops, you can drag two fingers across the trackpad to zoom in and out.
- **Zoom out** - There are a number of ways to zoom out with the mouse.

- Using the RIGHT mouse button (CTRL click on the Mac), double-click anywhere in the 3D viewer to zoom out from that point. The viewer will zoom out by a certain amount. Single-click to stop, or right double-click (CTRL click on the Mac) to zoom out more.
- If your mouse has a scroll wheel, you can use the scroll wheel to zoom out by scrolling away from you (forward motion). Use the ALT (alt/option on the Mac) key in combination with the scroll wheel to zoom out by smaller increments. [More settings](#).
- You can also position the mouse cursor on the screen and press the RIGHT mouse button (CTRL click on the Mac).

Once the cursor changes to a double arrow, move the mouse forward or push away from you, releasing the button when you reach the desired elevation.

If you want to zoom continuously out, hold the right button (CTRL click on the Mac) down and briefly push the mouse forward and release the button, as if you are "throwing" the scene. Click once in the viewer to stop motion.

- **Tilt the view** - If your mouse has either a middle button or a depressible scroll wheel, you can tilt the view by depressing the button and moving the mouse forward or backward. If your mouse has a scroll wheel, you can tilt the view by pressing the SHIFT key and scrolling DOWN to tilt the earth to "top down" view, or scrolling UP to tilt the earth for horizon view. See [Tilting and Viewing Hilly Terrain](#) for more information.
- **Rotate the view** - If your mouse has either a middle button or a depressible scroll wheel, you rotate the view to the left by clicking on the middle button and moving the mouse to the left. To rotate the view right, click on the middle button and move the mouse to the right. You can also use the CTRL (⌘ on the Mac) key in combination with the scroll wheel to rotate the view. Press CTRL (⌘ on the Mac) and scroll UP to rotate clockwise, CTRL (⌘ on the Mac) + scroll DOWN to rotate counter-clockwise. See [Tilting and Viewing Hilly Terrain](#) for more information.
- **Mouse Wheel** - [See above](#). To change these settings, click *Tools > Options > Navigation > Navigation Mode > Mouse Wheel Settings* (on the Mac: *Google Earth > Preferences > Navigation > Navigation Mode > Mouse Wheel Settings*). Move the slider to set how fast or slow your viewpoint of the earth zooms in or out. Check *Invert Mouse Wheel Zoom Direction* to reverse the direction of zooming when you use the mouse wheel.
- **Pan and Zoom navigation** - This mode is on by default when you start Google Earth. You can return to this mode from other modes by doing one of the following:
 - Type Ctrl (⌘ on the Mac) +T. When this mode is activated, the cursor changes to a hand symbol.
 - (Windows and Linux) *Tools > Options > Navigation > Navigation Mode > Pan and Zoom* . (Mac) *Google Earth > Preferences > Navigation > Navigation Mode > Pan and Zoom*

If you use a joystick or other non-mouse controller, you can also change how perspective moves in the 3D viewer under Controller settings. Choose *User-Based* to move your particular vantage point or *Earth Based* to move the globe. Check *Reverse Controls* to reverse the actions of the joystick.

- **GForce navigation (advanced)** - To change to this navigation mode, do one of the following:
 - Type Ctrl (⌘ on the Mac) + G to change when window focus is in the 3D viewer
 - (Windows and Linux) *Tools > Options > Navigation > Navigation Mode > Flight Control*. (Mac) *Google Earth > Preferences > Navigation > Navigation Mode > Flight Control*

This mode is in effect when the navigation cursor changes to an airplane. In addition, the effects of G-Force mode are most noticeable the closer you are to the terrain, and become less exaggerated the higher your eye elevation. The behavior of this navigation mode simulates that of a joystick, where the direction your mouse moves indicates specific joystick moves. If you are familiar with using a joystick, you'll be able to use this mode easily.

To pan left or right, or to tilt the horizon left or right, left-click and move the mouse right/left of center. To tilt to top-down view, left-click and move the mouse forward (away from you). To tilt to horizon view, left click and move the mouse back (toward you). To accelerate, right-click (CTRL click on the Mac) and move the mouse forward. To decelerate, right-click (CTRL click on the Mac) and move the mouse backward.

The response in the 3D viewer to your mouse movements is related to the vigorousness of your mouse movements, so you can test this mode out slowly using movements.

To return to standard trackball navigation mode, type Ctrl (⌘ on the Mac) + T. To stop motion in the viewer at any time, press the spacebar.

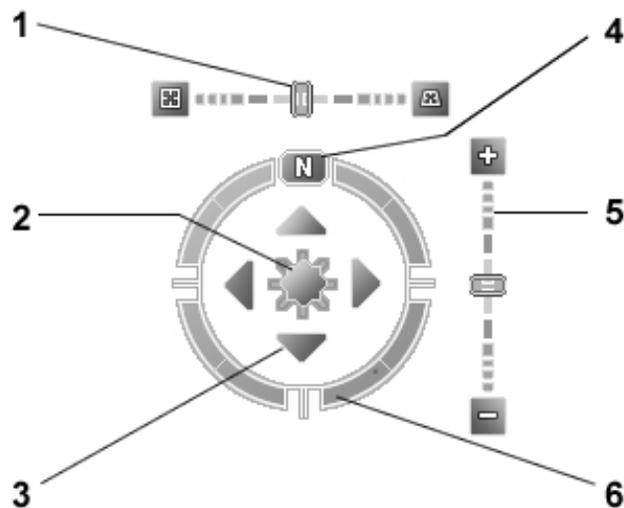
- **Click-and-Zoom navigation** - To change to this navigation mode, choose:
 - (Windows and Linux) *Tools > Options > Navigation > Navigation Mode > Click-and-Zoom*
 - (Mac) *Google Earth > Preferences > Navigation > Navigation Mode > Click-and-Zoom*

When the 3D viewer enters this navigation mode, the cursor changes to a cross-hair mark. Here, navigation with the mouse is limited: left-click to zoom in a set distance, and right-click (CTRL click on the Mac) to zoom out a set distance. Use the navigation controls to pan and rotate. Return to the standard trackball mode by typing Ctrl (⌘ on the Mac) +T.

Using the Navigation Controls

Note - To view and use the navigation controls, move the cursor over right corner of the 3D viewer. The navigation controls automatically appear whenever you do this; they fade from sight when you move the cursor elsewhere. See also [Showing or Hiding Items in the 3D Viewer](#).

The Google Earth navigation controls offer the same type of navigation action that you can achieve with mouse navigation. In addition, you can use the controls to tilt the view (perhaps for a perspective on terrain) or to rotate the viewer around the center. The following diagram shows the controls and explains their functions.



1. Use the tilt slider to tilt the terrain toward a horizon view. Move the slider to the left for a top-down view or to the right for a horizon view. Click the icons at the end of the slider to reset the tilt all the way to a top-down view or to a horizon view.
2. Use the joystick to move the center point of the view down, up, right or left. Click the center, hold the mouse button, and move in any direction.
3. Click the direction arrows to move the view in the direction you wish.
4. Click the north up button to reset the view so that north is at the top of the screen.
5. Use the zoom slider to zoom in or out (+ to zoom in, - to zoom out). Click the icons at the end of the slider to reset the zoom all the in or out.
6. Click and drag the navigation ring to rotate the view.

Note: You can also use the keyboard to control navigation, see [3D Viewer Navigation](#) in Keyboard Controls for more information.

Tilting and Viewing Hilly Terrain

When you first start Google Earth, the default view of the earth is a "top-down" view, which looks like the view straight down out of an airplane window when you are sufficiently zoomed in.

- **Tilt the terrain from 0 - 90 degrees** - You can use the mouse or the navigation controls to tilt the view in order to see a different perspective of the area you're exploring. You can tilt to a maximum of 90 degrees, which provides a view of the object as well as the horizon, in some cases.
- **Turn on terrain** - Using the tilt feature is particularly interesting when you are looking at a part of the earth where the terrain is hilly, so be sure to also have the terrain check box selected in the Layers panel when tilting the view.
- **Rotate the view for a new perspective** - Once you have tilted the view so that you are looking at a particular object, such as a hill, you can also rotate around that object. When you do this, the object remains in the center of the view, but you look at it from different perspectives (i.e., north, south, east, west) as you rotate around it.
- **Use the middle mouse button (if available) for seamless movement** - If your mouse has a middle button or a depressible scroll wheel, you can depress the button to both tilt and rotate the view. Movements up or down tilt the view, and movements left or right rotate the view. See [Using a Mouse](#) for more information.

The following figures show a comparison view of Mount Shasta in California with and without tilt enabled.



Top down view



Tilted view

You can adjust the appearance of the terrain if you would like the elevation to appear more pronounced. To do this, click *Tools > Options > 3D View* from the *Tools* menu (for the Mac, choose *Google Earth > Preferences > 3D View*) and change the *Elevation Exaggeration* figure. You can set it to any value from 1 to 3, including decimal points. A common setting is 1.5, which achieves an obvious yet natural elevation appearance. See [Viewing Preferences](#) for more information.

Resetting the Default View

After tilting and rotating the 3D view in Google Earth, you can always quickly reset to the default north-up and top-down view by clicking on the appropriate buttons in the navigation controls.

- Click the North-up button  to reset the view so that north is at the top of the viewer.
- Click the Reset Tilt button  to reset tilt to the default "top-down" view.
- (Windows and Linux only) Click in the 3D viewer and type r on the keyboard to reset the view (see [Keyboard Controls](#) for more).

Note - To quickly return to a known, familiar spot if you get lost, click on the *default* placemark in the *My Places* folder. This returns you to the center of your country (or a country that speaks your language). You can also edit the location and name for that *Default* placemark if you want to. See [Editing Places and Folders](#) for more information.

Consider also using the [Overview Map Window](#) as a way to provide an additional perspective on your location, especially when you are zoomed in to unfamiliar places.





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Finding Places and Directions

Note - Not all language versions of Google Earth support all the features described on this page. [Learn more here](#).

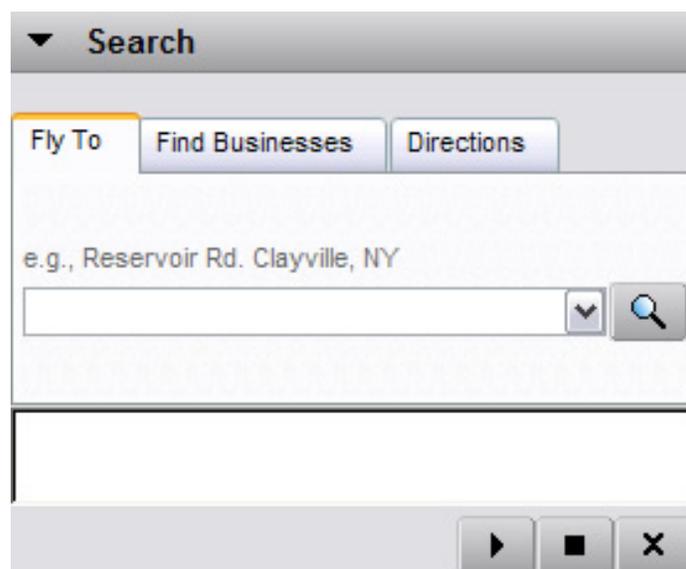
You can use the Google Earth Search panel to find places on the globe in the following ways:

- [Fly to or search for addresses and locations](#)
- [Getting and printing directions](#)
- [Touring and saving directions](#)
- [Showing and hiding points of interest](#)
- [Sight seeing](#)

This section covers basic search techniques using Google Earth. For more information on searches, see [Managing Search Results](#).

Finding Addresses and Locations

You can search for specific locations using the *Fly To* tab in Google Earth. To do this, enter the location in the input box and click on the *Search* button.



Search button

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Google search recognizes the following types of search terms, which you can enter with or without commas.

Format	Example
City, State	Buffalo, NY
City Country	London England
Number Street City State	1600 Pennsylvania Ave Washington DC
Zipcode or Postal Code	90210
Latitude, Longitude in decimal format	37.7, -122.2
Latitude, Longitude in DMS format	37 25'19.07"N, 122 05'06.24"W or 37 25 19.07 N, 122 05 06.24 W
	Note that format 37d25'19.07"N, 122d05'06.24"W does not work with Google Earth.

Note: Currently, street-level searching is limited to certain countries. [Learn more here.](#)

The most recent search terms are saved in the search entry history (indicated by the small black triangle on the right of the search input).

See [Managing Search Results](#) for more information.

About Search Terms

Certain search terms are not currently recognized as locations in the *Fly To* tab. These include:

- **Minor city names in many countries**
- **State or province names alone**
- **Search terms that are not a recognizable *location search* are treated as a *business listing search* over the current view.** For more information on how listing searches work, see [Searching for Listings](#).

Tip: If you want to find a particular street in a city, you can enter the name of the street alone, and the search engine will display the top 10 matches for that street entry. For example, if you want to find *Sunset Boulevard* in *Hollywood, CA*, you can enter the phrase *Sunset Blvd Hollywood CA* in the search field and the beginning of *Sunset Boulevard* will be displayed in the 3D viewer, along with the top 10 results for streets that contain the string *Sunset* in their name.

Searching for Listings

You can search for directory listings using the *Find Businesses* tab in Google Earth. To do this, enter your search term in the *What* input box and click on the *Search* button. The top 10 matching results are displayed in the current view. To target your search over a specific city, enter the name and state of the city in the *Where* input box. This returns the first 10 results from the center of that city outwards, searching web page information in that region.

Search Methods

You can use a number of search methods, including:

- **Exact names** (for example "*Cost Plus World Market*") - If you know the exact name of the listing you want, try entering that name within quotation marks to limit the number of results to those that match the entire string. This is the most specific type of entry, so if you receive unexpected results, you might be matching a web page entry for that exact term. Try removing the quotation marks for broader results or using one of the other methods described here. **Partial name** (i.e., *Disneyland*) - If you know part of the name (one word or more) in the listing you are searching for, you can use that. This type of search typically returns a greater number of matches than an exact name search. For example, if you search for *Disneyland* in Anaheim, CA, you will see results for *Disneyland Hotel* and other similar listings. If you have more than one word in your partial search, enter them with quotations to return only results that contain both of those terms in the order you have entered them (i.e., "*Greenwood Publishing*")
- **Keyword** (i.e., *colleges*, *salon*) - A keyword search returns business listings whose type matches the keyword search, even if the keyword itself is not in the title of the business. For example, the keyword *salon* can return results for *Supercuts* or *Hair By Jodi* and other businesses that are classified as a salon.

When you use the *Find Businesses* feature, you are using Google Maps search to search a combination of Yellow Page listings along with web page information for that region. For example, you might search *Shell Oil* and see a result for an investment company with holdings in Shell Oil Co. and whose web site also references the term *Shell Oil*.

Your search terms for both *What* and *Where* are saved in the entry history (indicated by the small black triangle on the right of the search input). When you log out of Google Earth, the last 10 search entries are saved for the next session. This location search history is independent of the location search history for the *Fly To* search panel.

A Find Businesses search starts in a radius either from the center of the

current view, or from the center of the location indicated in the *Where* input box. So, if you want to search for a movie theater close to a restaurant where you are having dinner, try entering the address of the restaurant in the *Where* input box when searching the term *movie theater*.

See [Finding Addresses and Locations](#) for example location searches and [Managing Search Results](#) for details on results.

Getting and Printing Directions

You can [get](#) and [print](#) directions to and from any placemark in the 3D viewer, or any place listed in the search results or available in the *Places* panel.

Getting Directions

Directions are available for a place or listing in the following ways:

- **Right-click (CTRL click on the Mac) on an icon or listing result** - In the pop-up menu, select either *Directions from here* or *Directions to here*. When you do this, the *Search* panel automatically transfers the information to the *Directions* tab. The route and turn-by-turn directions appear in the search listings window.



Search button

- **To Here/From Here** - To do this, click once on any search result listing or placemark to view the information balloon in the 3D viewer. Click *To Here* or *From Here*. Location information appears in the appropriate field (*From* or *To*) in the *Directions* tab. Repeat this action for either the starting location or the final destination and click the *Search* button. The route and turn-by-turn directions appear in the Search panel.
- **Enter start and ending points in the Directions tab.** You can manually enter valid location searches in each input box. After clicking the *Search* button, the route and turn-by-turn directions appear in the search listing window below the search input.

The direction route is mapped in the the 3D view with a line indicating the route. See [Getting and Printing Directions](#) and [Saving Directions](#) for more information on how you can use the results of your directions search.

Note - Direction are not always available for locations that are far from roads.

Printing Directions

1. Make sure that the [driving directions you created](#) are selected in the Directions tab.

2. Click *File > Print*. The Print dialog box appears.
3. Choose *Driving Directions* and click *Print*. Another Print dialog box appears.
4. Choose the appropriate printing options and click *Print*. Google Earth prints driving directions that include images of intersections that require turns.

You can remove the directions from the 3D viewer by clearing the check box next to your directions summary, or by clearing the search results entirely. See [Managing Search Results](#) for more details.

Touring and Saving Directions

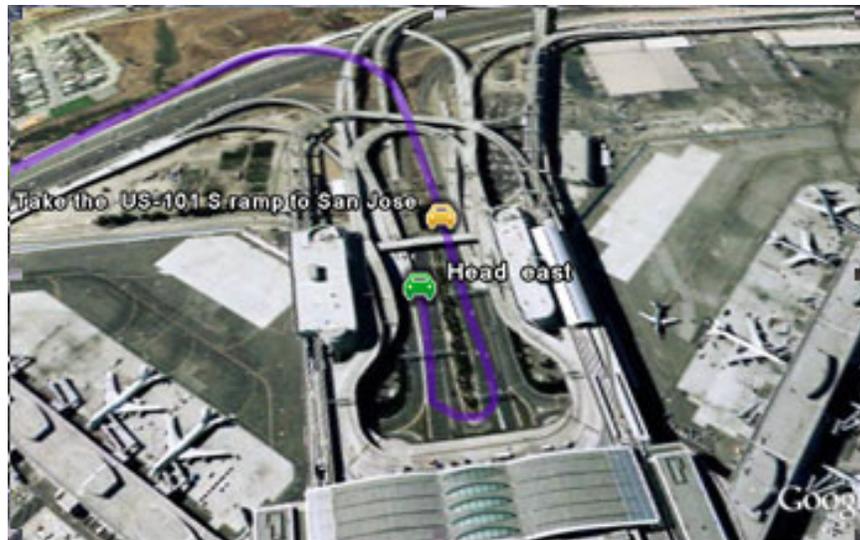
Once you have a route displayed in the 3D viewer, you can [use the tour feature](#) to "fly" the route in the 3D viewer, and you can [save the directions](#) to your *My Places* folder for later reference.

Touring the Route

Select the *Route* item at the end of the directions listing. Click the *Play Tour* button:



The 3D viewer automatically starts the tour from the departure point, oriented in the correct direction as if you were flying over the route you have marked. The tour follows the route, stops at the end, and zooms out to encompass the entire route in the 3D viewer. See [Touring Places](#) for more information.



Note - You can also display driving directions in an animated time sequence. To learn more, see [Viewing a Timeline](#).

Saving Directions

When you get driving directions between two points, those directions are listed beneath the *Search* button in a folder that is expanded to show all the turning points along the route. You can save those directions to your *My Places* folder as follows:

1. **Scroll up on the results listing until you see the top folder that contains your directions.** The folder is labeled with the *To* and *From* search words you entered.
2. **Collapse the folder by clicking on the minus icon.** This helps provide a less cluttered appearance in your *My Places* listing, but is not necessary.
3. **Right-click (CTRL click on the Mac) on the folder and select *Save to My Places* from the pop-up menu.** The folder is moved from the search listing window to your *My Places* folder. Because its appearance is collapsed before you save it, it also appears collapsed in your *My Places* folder. If you wish, you can save only individual route points to your *My Places* folder instead of the entire route.

Once you save the directions to your *My Places* folder, you can edit the folder and its placemarks in the same way you would any place data. See [Editing Places and Folders](#) for more information.

Showing and Hiding Points of Interest

The *Layers* panel holds an extensive list of points of interest (POIs) that you can turn on to display in the 3D viewer wherever you are. This listing includes:

- Businesses, such as banks, restaurants and gas stations
- Restaurants of a variety of styles
- Parks and recreation areas
- Airports, hospitals, and schools
- Postal, city, and school boundaries

Turn on a POI by checking it in the *Layers* panel. Turn off a POI by clearing the check box.

Note - To view all available POIs or layers, at the top of the *Layers* panel, beside *View*, be sure to choose *All Layers*.

You can interact with points of interest in the following ways:

- Find Directions to or from the POIs - See [Getting and Printing](#)

[Directions](#)

- Search the web for information on the POI - Click on the icon, and in the info balloon, click on the link that says *Google Search*. The web window appears below the 3D viewer or in a new browser window with the Google search results for that POI.
- Save the POI to your *My Places* folder
- Right-click (CTRL click on the Mac) on the POI icon and select *Save to My Places* from the pop-up menu. See [Using Places](#) for more information.

Tip: You can deselect a parent POI category and thereby hide data for that category, including sub-categories. This is faster than turning off multiple sub-categories one-by-one.

For more information on points of interest and layers, see [Using Layers](#).

Sightseeing

If you are using Google Earth for the first time, this feature is a great introduction. A *Sightseeing* folder inside the *My Places* folder contains a number of points of interest already marked on the earth for you to explore. To view them, expand the folder and double-click on one of the entries. The 3D viewer flies to that location.



Tip - If you are upgrading to Google Earth from a previous version, you can

access the *Sightseeing* folder by opening the *default_myplaces.kml* file located in the Google Earth installation folder, as follows:

1. Click *File > Open*. A dialog box appears. Use the dialog box to navigate to the folder where Google Earth is installed. If you installed Google Earth using the default method, look in *Program Files > Google > Google Earth* for the application.
2. Select the *default_myplaces.kml* file and click *Open*. A second *My Places* folder appears in the *Temporary Places* folder.
3. Expand this second *My Places* folder to view the *Sightseeing* folder within. If you wish, you can drag the sightseeing items to your original *My Places* folder if you want them to appear the next time you start Google Earth. Or, simply right-click (CTRL click on the Mac) on any place you want to save and select *Save to My Places* from the pop-up menu.

You can also tour places in the *Sightseeing* folder as you would any placemark. See [Touring Places](#).





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Marking Places

When you first start Google Earth, the *Places* panel contains an empty *My Places* folder to hold places that you want to save. (If you are upgrading from a previous version of Google Earth, Google Earth imports your saved places.) Every item located in the *My Places* folder is saved for subsequent Google Earth sessions. Items located in the *Places* panel but not saved in the *My Places* folder are located in the *Temporary Places* folder and are unavailable in the next Google Earth session if you do not move or save them to your *My Places* folder.

You can use the *Places* panel to save and organize places that you visit, address or listing searches, natural features, and more.

This section covers the basic ways to add a placemark to the *My Places* folder:

- [Create a new placemark](#)
- [Add a point of interest](#)
- [Add search results](#)
- [Saving an image](#)
- [Printing imagery from the 3D viewer](#)

For more information on other things you can do with placemarks, see [Using Places](#).

Tip: If Google Earth takes a long time to load, you might have more places saved than your computer can reasonably handle. Try moving some of the places you don't regularly visit to a folder and saving that folder to your computer. See [Saving and Sharing Places](#).

Creating a New Placemark

Follow these instructions to add a new placemark to any spot in the viewer.

[Sharing Places Information](#)

[Touring Places](#)

[Editing Places and Folders](#)

[Managing Search Results](#)

[Measuring Distances and Areas](#)

[Drawing Paths and Polygons](#)

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1. Position the viewer to contain the spot you want to placemark. Consider zooming into the best viewing level for the desired location. Choose any one of the following methods:

- Select *Placemark* from the *Add Menu*.
- Click the Pushpin icon on the toolbar menu at the the top of the screen



The *New Placemark* dialog box appears and a *New Placemark* icon is centered in the viewer inside a flashing yellow square. Position the placemark. To do this, position the cursor on the placemark until the cursor changes to a pointing finger and drag it to the desired location. The cursor changes to a finger pointing icon to indicate that you can move the placemark.



You can also lock the placemark position or set advanced coordinates for its position. Set the following properties for the new placemark:

- **Name** for the placemark
- **Description**, including HTML text (see [Writing Descriptions](#))
- **Style, Color** - Choose a color, scale (size) and opacity for the placemark icon
- **View** - Choose a position for the placemark. For explanation of terms in this tab, mouse over each field.
- **Altitude** - Choose the height of the placemark as it appears over terrain with a numeric value or the slider. Choose *Extend to ground* to show the placemark attached to a line anchored to the ground.
- **(Icon)** - Click the icon for the placemark (top right corner of the dialog box) to choose an alternate icon.

2. Click **OK** to apply the information you entered in the placemark dialog box.

Your placemark appears in the 3D viewer and as an entry in the selected folder. Once you save this placemark, you can always change its position and properties. See [Editing Places and Folders](#) for more information.

Saving a Point of Interest

You can save any point of interest (POI) displayed in the 3D viewer to the *My Places* folder by right-clicking (CTRL clicking on the Mac) on the placemark in the viewer and selecting *Save to My Places* from the pop-up menu.

You can also use the copy feature as follows:

1. Right-click (CTRL click on the Mac) on a POI and select Copy from the pop-up menu.
2. Open the My Places folder to display the destination folder for the POI.
3. Position your cursor over the desired folder or sub-folder.
4. Right-click (CTRL click on the Mac) and select Paste from the pop-up menu. The POI appears in the location you selected.

See [Showing and Hiding Points of Interest](#) for more information on viewing points of interest in the 3D viewer.

You can also move a saved POI to any folder in your *Places* panel. See [Organizing Places](#) for more information.

Sharing a Placemark

After you have created a placemark, you can easily share it with others on the [Google Earth Community BBS](#) website. To do this, right click (CTRL click on the Mac) on the placemark and choose *Share/Post*. The Google Earth Community posting wizard appears in a browser window at the bottom of your screen. Follow the instructions on this web page to post information about this placemark on the Google Earth BBS.

Note - You can also share information that appears in Google Earth via [KML files](#).

Saving Search Results

After you perform a search, a listing results panel also appears below the *Search* button. Each search term you enter is the title for the folder containing the top 10 results within it. You can collapse a particular search folder by clicking on the minus icon next to the search term. While you are logged in, you can revisit your search results just by double-clicking on an item in the search list. You can clear search results from the listing by clicking on the *Clear* button (**X**).

Once you log out of Google Earth, your search terms are cleared. However, you can save search results for future Google Earth sessions in the following ways:

- Drag and drop a search result item from the search results panel to any folder within the Places panel. Release the item to place it in the new location.
- Right-click (CTRL click on the Mac) on a search result in either the listing or the 3D viewer and select Save to My Places from the pop-up menu.
- Use the copy feature by right-clicking (CTRL clicking on the Mac) on a result listing in either the viewer or the Search panel and selecting Copy from the pop-up menu. From there, right-click (CTRL click on the Mac) on a folder in the Places panels where you want to save the search result and select Paste from the pop-up menu to paste the search result in your new location.

Tip: You can also save the contents of the entire search result to the *Places* panel by selecting the folder containing your search results and dragging it to the desired location.

Once a search result is saved, you can change its title, location, and description. See [Editing Placemark or Folder](#) for information.

Saving Images

Note - This feature is available to users of the Google Earth Pro and

Google Earth EC products. Visit <http://earth.google.com/products.html> for more information.

Use *File > Save > Save Image* to save the current view as an image file to your computer's hard drive. When you save an image, a *Save* dialog box appears and you can locate a folder on your computer to save the image to, just as you would for any document you might save. The image is saved with all visible placemarks, borders, or other Layer information visible in the 3D viewer.

You can save images in the following resolutions:

- Screen capture only (lower resolution)
- 1000 pixels per inch (PPI)

Google Earth PRO/EC users can save images in the following resolutions:

- 1400 PPI
- 2400 PPI
- 4800 PPI

Printing

Use the *Print...* command under the *File* menu to print the current view. You can also type *Ctrl* (⌘ on the Mac) + *P*. When you print an image, a *Print* dialog box appears that asks you to choose one of the following:

- *Driving Directions* - [Learn more here](#)
- *3D View + Placemark Details* - This is available if you have selected any placemark or folder in the Places folder. This prints the current 3D view plus placemark information and images.
- *3D View* - Choose an appropriate resolution (see below). You can then select available printers, just as you would for any document. The image is printed with all visible placemarks, borders, or other layer information visible in the 3D viewer.

You can print images in the following resolutions:

- Quick print (lower resolution)
- 1000 pixels per inch (PPI)
- 1400 PPI*
- 2400 PPI**
- 4800 PPI**

* Google Earth Plus and PRO/EC users only

**Google Earth PRO/EC users only



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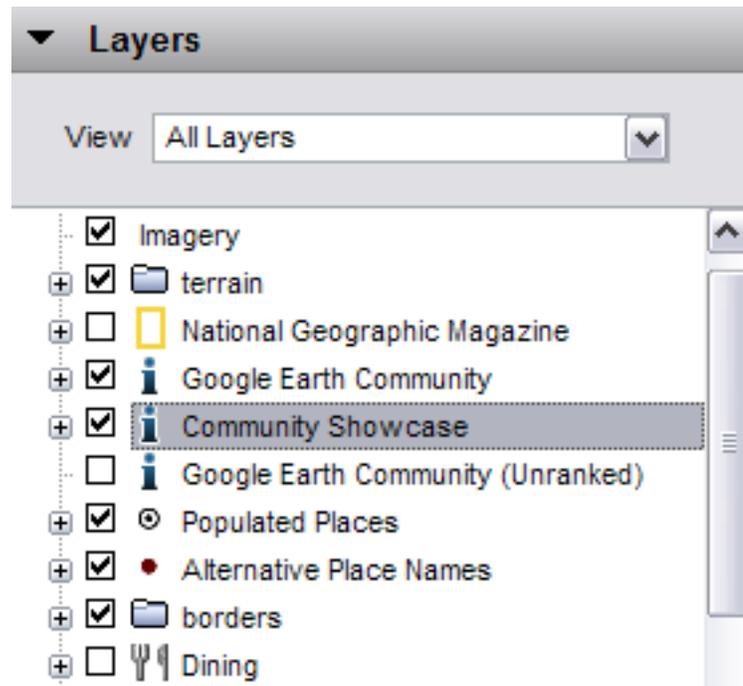
Using Layers

- [Using Points of Interest \(POIs\)](#)
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Using Layers

The *Layers* feature in Google Earth provides a variety of data points of geographic interest that you can select to display over your viewing area. This includes points of interest (POIs) as well as map, road, terrain, and even building data. The full list of layers is available in the *Layers* panel:



Note: In the *View* field, you can choose to display all available layers (*All Layers*), key layers (*Core*) or just those that are currently displayed (*Now Enabled*).

You can use the layer data feature of Google Earth to:

- [Display and save points of interest](#)
- Display map features such as borders, roads, and terrain
- [Display 3D Buildings](#)

Using Points of Interest (POIs)

This section contains tips on using points of interest not covered in

[Using Places](#)

[About KML](#)

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Locating POIs in Your Viewing Area

Follow these steps to find a particular point of interest in your viewing region.

1. Adjust the 3D viewer to encompass the area you want to investigate. If you are interested in finding all the schools in a particular city, then adjust the viewer so that you can view the entire city. You can do this by zooming out or by expanding the size of the viewer itself (use the maximize window control or drag the size of the window using the mouse).
2. Double-click on the Layers folder to expand it. You can also expand folders within the Layers folder to view certain sub-categories of POIs.
3. Select one or more points of interest in the list. If there is a point of interest or business of the selected type in the viewing area, that icon appears in the viewer. Certain selections - such as a geographical feature like a lake - do not always produce an icon, but will instead display a label near the corresponding area.

Saving or Copying POIs to My Places

Once you locate a POI that you want to save for future Google Earth sessions, you can right click (CTRL click on the Mac) on it and select *Save to My Places* from the pop-up menu. Alternatively, right-click (CTRL click on the Mac) and select *Copy* from the pop-up; then paste it over a target folder in the *Places* panel.

Viewing Layer Sub-Categories

Some points of interest act as a folder that contain categories of data. These are indicated by a plus icon which you can click to view the sub-categories for the item. For example, the *Dining* layer contains sub-

categories of all types of dining, from fast food to seafood. You can turn on restaurant information for a specific type of dining (i.e., seafood only), or you can select the top-level *Dining* check box to display all Dining types.

When you have a mix of items selected in a category, you can right-click (CTRL click on the Mac) on the parent folder and select *Hide Contents* from the pop-up menu to quickly hide all elements within the category.

Tuning Display of POIs

Because Google Earth can deliver hundreds of POIs to a single view, the icons marking them can be modified to make viewing them easier. The most common issues with POI display include:

- A POI doesn't appear over an area where one is expected
- No icons appear at all
- Icons overlap each other, making it hard to see the one being covered

Try the following to resolve the issue:

- **Zoom in closer to the region to see if the icon appears.** Remember that icons, like road data, appear at different elevations, and not all icons appear from an extended elevation. In addition, zooming in to a lower elevation often resolves the problem of icons that appear to overlap when viewed from a higher elevation.
- **Check the streaming meter to make sure downloading is complete.** This is located at the bottom of the 3D viewer. If you believe you are sufficiently zoomed in and no POI appears, it may be that data is still being streamed to your client. The Google Earth servers are streaming imagery, terrain, and other data to your application, so sometimes icons do not appear immediately.
- **Adjust the icon size.** You can change the size of icons from medium to small or large, depending upon whether you typically view the earth from a higher elevation or a lower elevation. Do this by selecting *Options* from the *Tools* menu. The icon size is set in the *Labels/Icon size* area. See [Viewing Preferences](#) for more details.



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Using Map Features

This section covers how to set and use the map controls, which include roads, terrain, borders, buildings, and models. Topics include:

- [Roads](#)
- [Terrain](#)
- [Borders](#)
- [Viewing 3D Buildings](#)
- [Viewing Google SketchUp 3D Models](#)

Roads

The road layer displays road map information for the viewing area, including major highways, county roads, and streets. This option is available in the *Layers* folder. In the *Layers* folder, you can expand the *Roads* folder and control the display for U.S., Canadian, and many international roads.

While road information for a given view is always available, it only displays in the viewer when a logical distance is reached. For example, if you are looking at a very large region, such as the southern area of a state, you see only major highways. When you zoom in to a more confined region, you see labels for those highways, as well as smaller highways and roads. The figure below shows only the major highways for the states in view.



Tip: If you cannot see the label for a highway or a road, zoom in or reposition the viewer until the label appears. Typically, you need to zoom in to see the label.

Terrain

[Polygons](#)

[Using Image Overlays and 3D Models](#)

[Importing Your Data Into Google Earth](#)

[Using Style Templates](#)

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The terrain layer shows 3D elevation data for the viewing region. Elevation data is limited to natural geographic features, like mountains and canyons, and does not apply to buildings. Turn this feature on to get an even clearer image of your favorite ski resort or canyon trail. You can turn terrain on by selecting on the *Terrain* item in the *Layers* folder.

You can also adjust the appearance of the terrain if you would like the elevation to appear more pronounced in your views. To do this, do the following:

Windows and Linux: Tools > Options > *3D View*. Modify the *Elevation Exaggeration value*.

Mac: Google Earth > Preferences > *3D View*. Modify the *Elevation Exaggeration value*.

The default value is set to 1, but you can set it to any value from 1 to 3, including decimal points. A common setting is 1.5, which achieves an obvious yet natural elevation appearance.

Tip: Because terrain data is additional information, more time is needed to download this information to Google Earth. If you are not interested in viewing terrain data, turn this layer off for faster streaming from the server to the viewer.

Borders

You can turn on border information by checking the *Borders* folder in the *Layers* tab. The *Border* check box turns on all possible borders, while you can expand the *Borders* folder to control display of the many kinds of borders, such as:

- Coastlines
- International boundaries
- State and province boundaries
- Countries and capitals
- State and province names
- USA county boundaries

When turned on, border information for a given view is always available. However, as with road data, it is displayed in the viewer when a logical distance is reached. For example, if you are looking at a very large region, you see only major boundaries. When you zoom in to a more confined region, you might see state or county labels depending upon your viewing elevation.

Viewing 3D Buildings

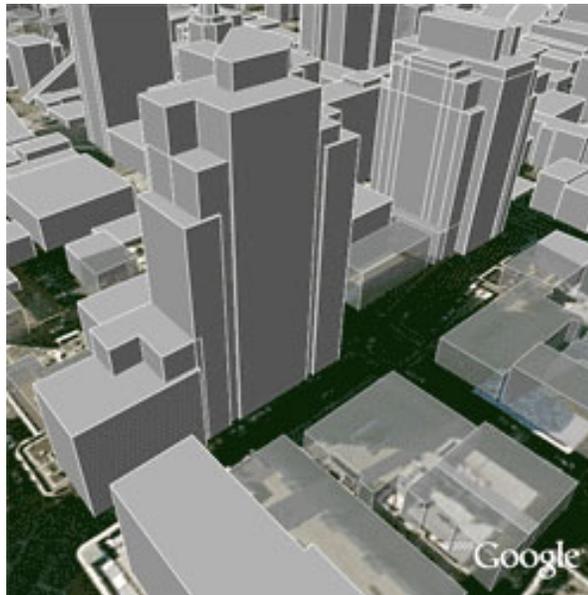
Some geographic areas in Google Earth database display simple 3D buildings. To

view these:

1. Turn on the 3D building layer by selecting the 3D Buildings folder check box in the Layers tab.
2. Position the viewer within a reasonable viewing altitude over a major city such as San Francisco. Some 3D buildings start to appear from an eye-elevation of 10,000 to 12,000 feet. Check the eye-elevation meter on the lower right of the 3D viewer to determine your current viewing height. The 3D buildings appear as light grey objects over the imagery of the city.



3. As you zoom in, more details will appear until you can see the entire shape of a building.
4. Use the [tilt and rotate navigation tools](#) to get the best view of the buildings.



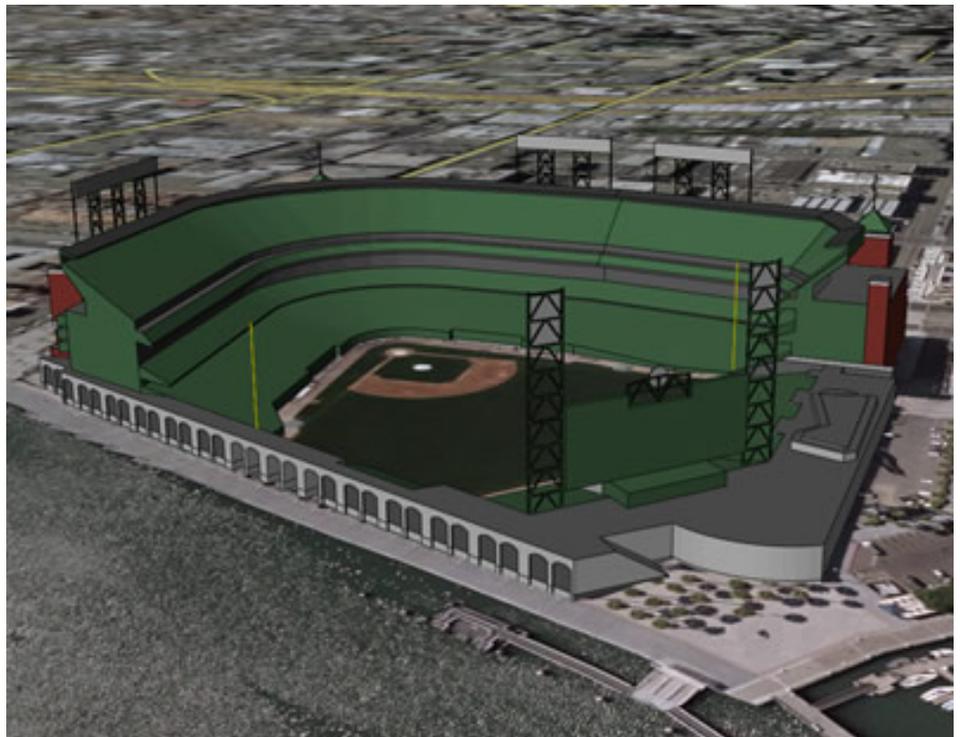
Viewing Google SketchUp 3D Models

Tip: Some Google SketchUp models do not appear correctly in Google Earth until you turn off the 3D buildings layer. For more information, see [Viewing 3D Buildings](#).

You can easily view Google SketchUp 3D models in Google Earth. To do this:

1. Visit <http://sketchup.google.com/3dwarehouse/>
2. Search for a model that interests you and click it.
3. Click *Download to Google Earth*. Note that this option may not be available for all models.
4. As you zoom in, more details will appear until you can see the entire shape of the model.
5. Use the [tilt and rotate navigation tools](#) to get the best view of the model.

For additional information, see [Using Google SketchUp with Google Earth](#).



A Google SketchUp model of AT&T Park in San Francisco

Tip - You can also view available 3D models using the [3D Model network link](#).





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Using Places

Once you are familiar with the basics of marking places on the Earth, you can refer to this section to learn all the features available to you in the *Places* panel. This section includes the following topics:

- [Organizing Places Data](#)
- [Saving Places Data](#)
- [Opening Saved Placemarks](#)
- [Deleting Places Data](#)
- [Showing and Hiding Places Data](#)

Organizing Places Data

You can organize your saved data in the *Places* panel in a way similar to how you would organize files and folders on your computer's hard drive. This section covers the following:

- [Creating Folders](#)
- [Reordering Placemarks or Folders](#)
- [Renaming a Placemark or Folder](#)
- [Removing a Placemark or Folder](#)

Creating Folders

You can create folders and move other folders, placemarks, or shapes to them. To create a folder:

1. Right-click on a folder in the *Places* panel.
2. Select *Add > Folder* from the pop-up menu. The folder you right-clicked on is automatically set as the container for the new folder.

Once the *New Folder* dialog box appears, you can set the following

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fields:

- **Name**
- **Description** - Enter a description for the folder. For example, you might enter text that gives a general description of all the placemarks in the folder. The first few words of the description appear below the folder in the *Places* panel. When you double-click the folder, the description appears in a balloon in the 3D viewer. In addition, you can use a number of HTML tags to format your description and include images, including ``, `
`, ``, and ``. See [Writing Descriptions](#).
- **Style/Color** - Once you have other icons within the new folder (or its subfolders) the *Style/Color* tab is available. You can use this feature to apply label and icon styles universally across all items within the folder. See [Editing Places and Folders](#) for more information.
- **View** - See [Setting the View](#) for details. Once you set a view for a folder, double-clicking on the folder repositions the 3D viewer to the position you have chosen. Setting a view for a folder is useful when you want to create a viewing angle to encompass all the items contained by the folder. For example, you might have a collection of placemarks in a specific region of the city, each with an independent viewing angle. You can place them all in a folder and set a viewing angle for the folder in order to display all of the placemarks from a consistent viewing angle, if desired.

Reordering Placemarks or Folders

You can reposition a placemark or folder in three ways:

- Drag it to a new position in a list of items.
- Drag and drop it over a folder.
- Right-click (CTRL click on the Mac) the item and select Cut from the pop-up menu, followed by right-clicking on the new position or folder and selecting Paste from the pop-up menu.

In this way, you can put placemarks inside newly created folders, or you can move an entire folder and its contents into another folder to create groups of folders.

Note: If you move a folder so that it is inside the *Temporary Places* main folder, you must save that data if you want it to be available the next time you start Google Earth. If you exit Google Earth without saving the folder, a dialog box prompts you to save the information to your *My Places* folder. See [Saving Places Data](#) for details.

Renaming a Placemark or Folder

To quickly rename an item, right-click (CTRL click on the Mac) on it and select *Rename* from the pop-up menu. You can enter the new name directly in the name field. You can also:

- Choose *Rename* from the *Edit* menu if the item is selected in the list
- (Windows and Linux only) Select the item and press *F2* on the keyboard

Removing a Placemark or Folder

To delete an item, right-click (CTRL click on the Mac) the entry and select *Delete* from the pop-up menu, or select *Delete* from the *Edit* menu when the item is selected in the *Places* panel. A confirmation dialog box asks if you want to delete the placemark or folder. If you delete a folder, you also delete all its contents, including other folders and icons. Click *Yes* to confirm the deletion.

Saving Places Data

You can save placemarks, shapes, and entire folders (and their contents) to your computer's hard drive. The placemark file or folder is saved as a single file in *KMZ* format, which you can open at any time in Google Earth. You might want to do this for the following reasons:

- **You want to share the saved data with other Google Earth users.** You can email any placemark, shape, or folder to another Google Earth user from within Google Earth, but you can also email any *KMZ* file located on your computer to a Google Earth user. In addition, you can post a *KMZ* file to the Google Earth BBS where other Google Earth users can view the information, or you can serve the file on your own web server or from any network location. See [Sharing Places Information](#) for details.

- **You have so many places in your My Places folder that Google Earth startup is slow.** Each time you start Google Earth, all the places data is processed during startup, even if it is not turned on in the 3D viewer. Holding a large amount of data in the *My Places* folder can impact the performance of Google Earth, depending upon your computer. By saving folders to your hard drive, you can improve Google Earth performance by then deleting the data from your My Places folder once they are saved to disk. You can always open the data you save at any time.

Save individual placemarks, shapes, or entire folders by right-clicking (CTRL click on the Mac) the item and selecting *Save As...* from the pop-up menu.

Use the *File* dialog box to save the placemark or folder to your computer. Enter the name for the new file, and click *Save* in the dialog box. The placemark or the folder is saved to that location with an extension of *.kmz*.

Important: Placemarks created with Google Earth version 3.0 or higher cannot be viewed in older Google Earth software. As an alternative, you can send an image file. See [Saving Images](#) for details.

Opening Saved Placemarks

You can use the following methods to open placemarks and folders saved to the file system on your computer's hard drive.

- From the File menu, select Open. Navigate to the folder on your computer that contains the KMZ or KML data you want to open in Google Earth. Select the file and click the *Open* button. The folder or placemark appears beneath the *Temporary Places* folder and the 3D viewer flies to the view set for the folder or placemark (if any).
- Locate the file you want to open. Once you have located the file on your computer, you can simply drag and drop the KMZ file over the *Places* panel or 3D viewer. The 3D viewer load the file and flies to the view set for the folder or placemark (if any).

Tip: When you use the drag-and-drop method of opening a placemark or folder, you can drop the item over a specific folder in the *Places* panel. If the *My Places* folder is closed and you want to drop it there,

just hold the item over the *My Places* folder until the folder opens up and you can place the item within subfolders or in the list. Items dropped in the *My Places* folder appear the next time you start Google Earth. Otherwise, you can drop the item in the *Temporary Places* folder. Items opened this way appear only for the current session of Google Earth unless you save them.

Deleting Places Data

There are a number of ways you can remove data from the Places panel:

- **Delete** - Right-click (CTRL click on the Mac) a placemark, folder, or other item in the *Places* panel and select *Delete* from the pop-up menu. You can also delete items in the 3D viewer by right-clicking (CTRL click on the Mac) on the icon and selecting *Delete* from the pop-up menu. This deletes the item from the *Places* panel. If the item is located in your *Temporary Places* folder, it does not appear the next time you use Google Earth. If you have previously saved the item, you can always open the saved data at any time. Otherwise, the item is permanently removed.
- **Delete Key** - With the item selected in the *Places* panel, press the *Delete* key. A dialog box asks to confirm the deletion. Click *OK* to remove the item from the Places panel.
 - **Delete Contents** - Right-click (CTRL click on the Mac) a folder and select *Delete Contents* from the pop-up menu. Click *Yes* on the confirmation dialog box to proceed with deleting the contents. All folder contents are removed, including any subfolders and contained items.
 - **Cut Contents (Ctrl-X)** - Right-click (CTRL click on the Mac) an item in the *Places* panel and select *Cut* from the pop-up menu, or right-click on a placemark in the 3D viewer and select *Cut* there. The item is removed from the listing or view, but copied to the clipboard, so that you can later paste it to a different location.

Showing and Hiding Places Data

Once you begin collecting a fair amount of place data, you can use the show/hide features of Google Earth to quickly manage the amount of content visible in the 3D viewer.

To hide places data, select or de-select the check box next to an item. To turn off the display for a single placemark or overlay in the 3D viewer, click the item to remove the check mark. To turn on a single item, select the check box. For entire folders, you can turn on all items in the folder by selecting the folder's check box if it is not already selected. In this case, all items in the folder are turned on. A subsequent click turns off all items in the folder.

Note - If a square appears in the check box for a folder, this indicates that some (but not all) of the items within that folder are currently displayed.



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About KML

KML, or *Keyhole Markup Language*, is an XML grammar and file format for modeling and storing geographic features such as points, lines, images, polygons, and models for display in Google Earth and [Google Maps](#). You can use KML to share places and information with other users of Google Earth and Google Maps. Likewise, you can find KML files on the [Google Earth Community site](#) that describe interesting features and places.

A KML file is processed by Google Earth and Google Maps in a similar way that HTML and XML files are processed by web browsers. Like HTML, KML has a tag-based structure with names and attributes used for specific display purposes. Thus, Google Earth and Google Maps act as browsers of KML files. [Learn more here](#).

[Google Maps](#) can only display certain features of KML. For more information, see [this Google Maps Help topic](#).

Note - A KMZ file is a compressed version of a KML file.

KML Specification and Tutorial

You can learn more about using KML by reading the specification. At this time, this document is in English only:

<http://earth.google.com/kml/>

Also, you can try a hands-on approach to learning KML by following the KML tutorial. At this time, this document is in English only:

http://earth.google.com/kml/kml_tut.html

Note - You can display KML data in a time sequence. To learn more, see [Viewing a Timeline](#).

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Sharing Places Information

The section describes how you can share placemarks, shapes, and folder data with other people - including both users and non-users of Google Earth. You can share your places data by:

- [Emailing an Image](#)
- [Emailing Places Data](#)
- [Sharing Data Over a Network](#)
- [Creating a Network Link](#)

Note - You can also share places information with other Google Earth users via the Google Earth Community BBS website. For more information, see [Sharing a Point of Interest](#).

Emailing an Image

At this time, emailing a Google Earth image on the Mac is available only through the Mail, Entourage and Eudora applications. You can email the current view of the earth shown in the Google Earth 3D viewer as:

- An image file for people who don't have Google Earth
- A KMZ file for other users of Google Earth

When you email an image, a JPEG file is automatically attached to an outbound email message. When you email the view as a KMZ, a KMZ file is automatically attached to an outbound email message. To email an image:

1. Do one of the following:
 - Click *File > Email > Email Image*.
 - Type Ctrl+Alt+E (Windows and Linux only)
 - Click on the email icon  on the toolbar and choose *Email Image*.
2. In the *Select Email Service* window, choose your default email program or your Gmail account. If you use your Gmail account, you will be prompted to sign in if you have not already.

Before selecting your email service, select the *Remember this setting...* check box if you want to use the same email service every time you email a view. You can always change your email preferences later by selecting *Tools > Options > General* (Windows/Linux) or *Google Earth > Preferences* (Mac) and clicking on the *General* tab.
3. Wait while the Google Earth software sends the data to your email application. A new email window appears with the image file. (This can take a few seconds.) The image is a JPG file of the current view in the 3D viewer.

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4. Fill in the recipient's email address and any other information in the body and send the email.

When you email an image, the quality of that image is identical to the quality available for the Save Image feature in Google Earth.

Emailing Places Data

Note - On the Mac, you can only email through the Mail, Eudora and Entourage applications.

In addition to emailing a *view* as a KMZ file to other users of Google Earth, you also can email places data in two other ways:

- Attach a KMZ file or folder saved to your computer's hard drive to an email. If you followed the instructions listed in [Saving Places Data](#), locate your saved KMZ file and attach it to an outbound email as you would with any attachment.
- Email a placemark that is centered in your 3D viewer directly from Google Earth (see below).

To email places data:

1. Do one of the following:
 - Click *File > Email > Email Place* .
 - Type Ctrl + E (⌘ + E on the Mac)
 - Click on the email icon  on the toolbar and choose *Email Place*.
 - Right click (CTRL click on the Mac) the appropriate placemark in the Places panel and choose *Email*.
2. In the *Select Email Service* window, choose your default email program or your Gmail account. If you use your Gmail account, you will be prompted to sign in if you have not already.

Before selecting your email service, select the *Remember this setting...* check box if you want to use the same email service every time you email a view. You can always change your email preferences later by selecting *Tools > Options > General* (Windows/Linux) or *Google Earth > Preferences* (Mac) and clicking on the *General* tab. Wait while the Google Earth software sends the data to your email application. A new email window appears with the KMZ file. (This can take a few seconds.)

3. Fill in the recipient's email address and any other information in the body and send the email.

Things to consider:

- When you email KMZ files that reference custom icons or image overlays from your local file system those items are included with the placemark data. For this reason, KMZ files that include imagery overlays might be larger than those containing a simple placemark.
- If you are sending a placemark file to a user of a Google Earth (Keyhole) client version 2.2 or lower, the recipient will not be able to view the placemark. The file format for placemarks has changed for Google Earth versions 3.0 and higher. Send an image file instead.

Troubleshooting Email Issues

Note - On the Mac, you can only email through the Mail, Eudora and Entourage applications.

If your email application does not respond to the *Email View* command, you may need to set the default email program. To do this in Windows, open the *Control Panel* from the Start menu and select *Internet Options*. Click the *Programs* tab, select the default email program that you use from the *E-mail* drop-down list, and click *Apply*. You should now be able to send a view with your email application. To do this on a Mac, open Mail. Click Mail > Preferences. Pick the email application you'd prefer as your default email handler.

Sharing Data Over a Network

In addition to saving placemarks or folders to your local computer, you can also save place data to a web server or network server. Other Google Earth users who have access to the server can then use the data. As with other documents, you can create links or references to KMZ files for easy access. Storing a placemark file on the network or on a web server offers the following advantages:

- **Accessibility** - If your place data is stored on a network or the Web, you can access it from any computer anywhere, provided the location is either publicly available or you have log in access.
- **Ease in Distribution** - You can develop an extensive presentation folder for Google Earth software and make that presentation available to everyone who has access to your network storage location or web server. This is more convenient than sending the data via email when you want to make it persistently available to a large number of people.
- **Automatic Updates/Network Link Access** - Any new information or changes you make to network-based KMZ information is automatically available to all users who access the KML data via a network link.
- **Backup** - If for some reason the data on your local computer is corrupt or lost, you can open any of the KMZ files that you have saved to a network location, and if so desired, save it as a local file again.

Note: Before you can create a network link to an item in Google Earth, you must first store that place data on a server.

This section covers the following topics:

- [Saving Data to a Server](#)
- [Opening Data from a Network Server](#)
- [About Network Links](#)
- [Creating a Network Link](#)

Saving Data to a Server

To make your placemarks or folders available to other people via a server, you need to first save the file to the appropriate location.

- **Network Server** - To save a folder or placemark to a location on your network, simply

follow the steps in [Saving Places Data](#) and save the file in a location on your company network rather than to your local file system.

- **Web Server** - To save a placemark or folder to a web server, first save the file to your local computer as described in [Saving Places Data](#). Once the file is saved on your local computer as a separate KMZ file, you can use an FTP or similar utility to transfer the file to the web servers.

If you want users to be able to open KML and KMZ files from a web server, you may need to add MIME types for the server. These are:

```
application/vnd.google-earth.kml+xml kml
application/vnd.google-earth.kmz kmz
```

Opening Data from a Network Server

If you are working in an organization where place data is saved to a network that you have access to, you can open that data in the same way you would open a saved KMZ file on your local computer.

- **From the File menu, select Open** (Ctrl + O in Windows/Linux, ⌘ + O on the Mac) - Navigate to your network places and locate the KMZ or KML data you want to open in Google Earth. Select the file and click the *Open* button. The folder or placemark appears in the *Places* panel and the 3D viewer flies to the view set for the folder or placemark (if any).

Files opened in this way are *NOT* automatically saved for the next time you use Google Earth. If you want the placemark or folder to appear the next time you use Google Earth, drag the item to your *My Places* folder to save it for the next session.

- **Locate the file you want to open** - Once you have located the file on your network places, you can simply drag and drop the KMZ file over the *Places* panel. The 3D viewer flies to the view set for the folder or placemark (if any).

When you use the drag-and-drop method of opening a placemark or folder, you can drop the item over a specific folder in the *Places* panel. If the *My Places* folder is closed and you want to drop it there, just hold the item over the *My Places* folder until the folder opens up and you can place the item within subfolders or in the list. Items dropped in the *My Places* folder appear the next time you start Google Earth. Otherwise, you can drop the item in the white space below the *Places* panel so that it appears in the *Temporary Places* folder. Items opened this way appear only for the current session of Google Earth unless you save them.

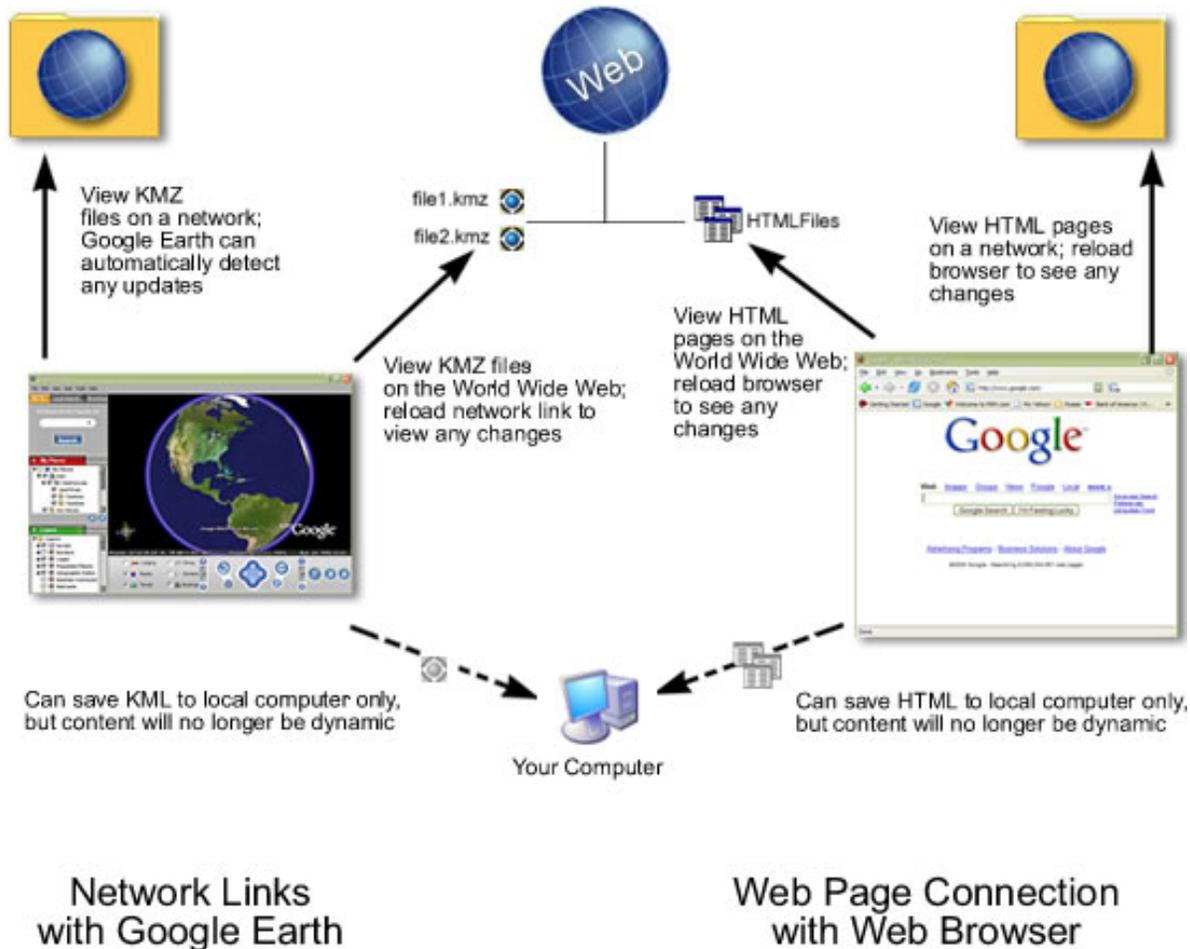
About Network Links

The network link feature in Google Earth provides a way for multiple clients to view the same network-based or web-based KMZ data and automatically see any changes to the content as those changes are made. A network link allows for content publishing in a manner similar to web page/web browser content delivery:

- **A network link provides a way to deliver dynamic data to multiple Google Earth users.** When users connect to your KMZ file via a network link, either you or they can specify how often to refresh the data in the file. This way, regular updates made to the content by one person are automatically reflected in all connected clients.
- **A network link is intended as a view-only reference to published content.** Just as web pages are viewed by many people but only modifiable by those with permission, place data content can be linked to and seen by multiple users while set to be modifiable

only by one author. As with web pages, users who are viewing the content can always save that content to their hard drive, but they can only receive dynamic content via a network link.

The following figure illustrates the parallels between web-based content and KMZ content via a network link using Google Earth.



Creating a Network Link

Before you can create a [network link](#), the content you want to link to must exist on the network or web server that you are linking to. If you are authoring the content, see [Saving Data to a Server](#) for details about saving KMZ files to a web or network server. If you are only linking to the content, be sure you know either the network location of the file or the URL if it is located on a web server.

1. Choose any one of the following ways to start:
 - o Select *Network Link From* from the *Add* Menu. Select *Network Link* from the pop-up menu.
 - o Right-click (CTRL click on the Mac) on a folder in the *My Places* Panel. Select *Add > Network Link* from the pop-up menu. When you add a network link in this way, the selected folder is automatically set as the container for the network link.

The *New Network Link* dialog box appears. Enter the name of your link in the *Name* field. Enter the full path of the KMZ file in the *Link* field, or browse to the file location if the file is located on a network. You can use a URL to reference the KMZ, such as `http://www.test.com/myKMZ.kmz`. The 3D viewer immediately flies to the default view for the linked data.

2. Enter descriptive text or HTML. You can enter this data in the same way you would for a regular folder. See [Editing Places and Folders](#) for more information.
3. (Optional) Click the View tab to change the default view that this network link presents to users. Click *Snapshot current view* to use your current view in Google Earth. If your network link has more than one placemark, click *Reset* to display all these placemarks to users.

Note - The text you enter in this description is your description of the link only and is not viewable by anyone else linking to the KMZ file. Only you will be able to see the description you enter here (unless you email your link folder to other people). This is similar to creating a bookmark for a web page and then adding a descriptive note about the bookmark.





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Making Movies with Google Earth

Note - Movie making features are available to users of the Google Earth Pro and Google Earth EC products. Visit <http://earth.google.com/products.html> for more information.

You can use the Movie Maker feature of Google Earth to record 3D viewer imagery and save the recording as a movie file. You can either set the recorder

to record your interactions with the 3D viewer in real-time, or you can set up a tour and record the entire tour without interruption.

Once you finish recording and have saved your file, you can make the file available on a web site, use it in a presentation, or send it via email. For instance, you might want to create a movie of your property to present to clients or at trade shows where visitors can see satellite views of your property without having to use Google Earth.

The Movie Maker feature supports different movie file formats:



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- **Windows Media Video (WMV)** - (Windows and Linux only)
This output file format is compressed and optimized for presentations. These WMV files can be further configured for the best type of delivery, such as via a T1 web connection or over a 56K modem connection.
- **Audio Video Interleave (AVI)** - (Windows and Linux only)
Movies created in AVI format are uncompressed and as a result, generate extremely large files, making it almost impossible for a standard movie player to play back the recording. This is useful only if you want to edit the movie clips using a movie editing software.
- **Image Stream (JPG)** - Movies can be captured as images in variable or fixed length. This format is useful if you want to control the speed artificially and edit each screenshot (frame by frame).
- **QuickTime** - (Mac only) Movies can be captured in Apple QuickTime .mov format.

Movie Quality Levels

The Movie Maker feature also supports two types of movie quality levels:

- **Standard quality movie (real-time)** - Use this option when you want to adjust the visibility of icons and overlays while the movie is recording. For example, use this option to display an overlay of a site plan or additional layers of information as you record. Keep in mind that with this option, the frame rate is limited to the performance of your graphics card, which is generally slowed by making movies.
- **High-quality movie (tour-mode only)** - In general, high quality recordings work best when you want to display the movie on a large screen. Use this option to achieve the best possible movie recording. With this option, each frame is completely downloaded to the Google Earth client before it is recorded, maximizing image quality. For this reason, recording time is comparatively slow. Unlike the standard quality movie, you do not need to monitor the actual recording of the movie.

Note - Keep in mind that high quality movies can only play back tour points. You cannot manually interact with the 3D viewer when using the high quality option.

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Tips for Recording Movies

This section covers a number of tips to help you create quality movies. We recommend you familiarize yourself with these tips before beginning your recording in order to produce the best possible movie for your needs.

Update Your Movie Player

Having the latest version of Windows Media Player or Apple QuickTime installed is absolutely essential to making good quality movies, especially if you are having issues with the graphics quality of your movie. We highly recommend that you download Windows Media Player 9 or above:

<http://www.microsoft.com/windows/windowsmedia/player/9series/default.aspx>

Or for the Mac:

<http://www.microsoft.com/windows/windowsmedia/player/mac/default.aspx>

You can find the latest version of Apple QuickTime here:

<http://www.apple.com/quicktime/>

Update Your Graphics Card Driver

Although graphics card drivers have no impact on the actual *recording* of your movie, a faulty graphics card driver can produce anomalies in your 3D viewer that then transfer into the movie itself. Therefore, it's always good practice to update your driver to avoid any possible rendering issues. We recommend that you use a graphics card with at least 64 MB of video RAM or above.

Increase Your Memory Cache

By increasing your memory cache size, your movie recording experience will go faster (although it will have no impact on the final quality of your movie). To increase your memory cache, see [Memory and Disk Cache Preferences](#).

Increase the Detail Area of the 3D Viewer

Increasing the area of detail for your 3D viewer helps to capture all the pixels in more detail. As a result, the resolution of your movie is improved. See [Viewing Preferences](#) for instructions.

Note - Set *Detail Area* to *Large* if you have 64 MB of graphics card memory or more. If you have less than 64 MB of graphics card memory, set *Detail Area* to *Medium*.

Adjust the Touring Speed

When recording, it is best to use a relatively slow tour speed. However, feel free to experiment with different speeds and then play the movie back to evaluate whether the speed is appropriate. See [Touring Places](#) for details.

Note - The tour speed you choose will be consistent throughout the movie. If you want to set different tour speeds for different Placemarks in the same movie, you will need to create separate movie files for each tour and then edit them in a movie making software.

Adjust the Elevation Exaggeration

If you want to enhance the appearance of terrain in your movie, you can adjust the *Elevation Exaggeration* as described in [Viewing Preferences](#).

Showing or Hiding Items in the 3D Viewer

To hide or show the compass, status bar, scale legend or [grid](#), simply uncheck or check these items in the View menu. Likewise, in this same menu, you can check or uncheck Atmosphere to hide the atmosphere around the globe when viewed at full horizon or from space. See also [Using the Overview Map](#) and [3D Viewer Options](#).

Preview Your Tour Setup Before Recording

It's a good idea to set up and review the tour points you want to visit in your movie. This involves two simple actions:

- In the *Places* panel, select either an entire folder to view all the placemarks within it, or select individual items in the folder to view only selected ones. See [Touring Places](#) for details.
- Click the *Play* button that appears below the *Places* panel to play the tour. This tour is the same tour that will be followed if you use the *High Quality Movie* option, so you can have a sense of what your movie will look like by playing the tour. See [Touring Places](#) for details.

After previewing your movie, be sure to make any adjustments necessary before recording. For example, if you want to change the view of a particular placemark on the tour, you can always right-click (CTRL click on the Mac) on the placemark, then select *Snapshot View* in the menu. This will overwrite your existing placemark view. See [Editing Places and Folders](#) for more details.

Set Up Your System for Maximum Efficiency

Making movies is a memory-intensive and graphics-intensive process. It's best not to have multiple large applications running on your computer during recording. Disable both screen savers and pop-up blockers.

Steps for Recording Movies

Note - Movie making features are available to users of the Google Earth Pro and Google Earth EC products. Visit <http://earth.google.com/products.html> for more information.

Follow these steps to record your movie:

1. From the Tools menu, select *Movie Maker*. The Movie Maker dialog box appears.
2. **From the *Supported Compression Formats* selector, choose the desired compression format for your movie.**

If you want to have a movie format other than WMV (Windows Media Video) or .mov (QuickTime), check the *Advanced* checkbox and choose the format. If you choose another movie format, only standard AVI compression is available. Note that AVI formats are not compressed and therefore will result in

large files.

3. **Select *High Quality* or *Standard Quality* as the movie quality.** See [Movie Quality Levels](#) for details.
4. **Choose the Frames Per Second (FPS) you desire for your movie.** The highest FPS setting, 60, offers the smoothest movie viewing experience, but at the cost of a large file size. For instance, if you want to record a 800 x 600 movie at 60 FPS, you will not achieve the best results. In this case, choose a lower setting in order to produce a smaller file. The lower the FPS setting, the more jerky the movie will be. You'll want to find the best compromise between frame transition and file size. Typically, a setting of 30 works fairly well for movies that you want to provide over the Internet.
5. **Choose the resolution for your movie.** You'll want to choose a resolution that is appropriate for your final movie display. For example, you might have a computer screen projector that only supports a 800 x 600 format. You can specify the following resolutions, which indicate the width and height of the movie in pixels:
 - 320 x 240
 - 640 x 480
 - 800 x 600
 - 720 x 480 (NTSC) - This setting works well with large screen displays.
 - 720 x 576 (PAL)
 - 1280x720 (HD)
 - 1920x1080 (HD)
6. **Specify a name for your movie.** Click on the *Browse* button and navigate to a location on your computer where you want to save the movie file when you are finished recording. Type in a name for the file in the file dialog box and click on the OK button.

Alternatively, you can select an existing movie file in the same format as the one you are about to create, and that file will be overwritten with the contents of your new recording.

Note - If you are recording your movie as an image stream, it's best to choose a new filename or folder location rather than overwriting an existing image stream selection.

7. **Click the *Record Tour* button.** The button is available only after you enter a valid filename for your movie. When the movie begins recording, the Movie Maker dialog box appears below so you can visualize the recording of the movie.

Note - Recording time in high quality movies occurs very slowly, since each frame is fully processed before the next one is viewed.

When You Are Finished

When you are finished the [steps of recording movies](#), to stop recording, click the *Stop Recording* button in the Movie Maker dialog box. Once you finish recording your movie, you can open the movie file in a media player that supports the movie format you selected and play back the movie to view the results. If you are satisfied with the results, you can post the file to a local server or use it in a presentation.





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**Managing Search
Results**

• [Search Results Basics](#)

Managing Search Results

Once you begin [searching for places and listings](#) and have learned how to save them, you can learn about:

- [Search Results Basics](#)
- [Clearing Search Results](#)
- [Printing Search Results](#)
- [Viewing Many Results](#)

Search Results Basics

This section covers the basic search results features not covered in [Finding Places and Directions](#).

- Matching search results are displayed in the 3D viewer with an icon to mark the search. The alphabetical icons next to each result corresponds to its matching item in the search list view for easy cross reference. By default, only the most recent search is turned on in the 3D viewer, but you can turn on the icon for any search result by selecting its check box in the search list view. You can turn on the display for entire search results by selecting that search folder's check box.
- You can also delete the entire contents of a search result by right-clicking (CTRL click on the Mac) on the folder and selecting *Delete Contents* from the pop-up menu.
- You can perform the same operations on search results and their folders that you would for any item in your *Places* panel, including organizing, touring, deleting, and editing.

Clearing Search Results

To clear search results, click on the *Clear* button  at the bottom of the search results listing. This removes all search results from both the listing and the 3D view except for those that have been saved to

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the *My Places* folder.

Printing Search Results

You can print all results from your search by clicking on the *Printable view* link in the search results window. When you do this, the Google Maps web window appears at the bottom of the screen, and you can click on the *Print* button on that web page to print your search results.

Viewing Many Results

Oftentimes a search over a category in a metropolitan area returns many results all crowded in a small region. Sometimes, a label appears next to one icon, but not another, or a group of icons has no label, or one icon overlaps another one. Follow the [guidelines for tuning the display on Points of Interest](#) in order to resolve common issues with numerous search results.

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Measuring Distances and Areas

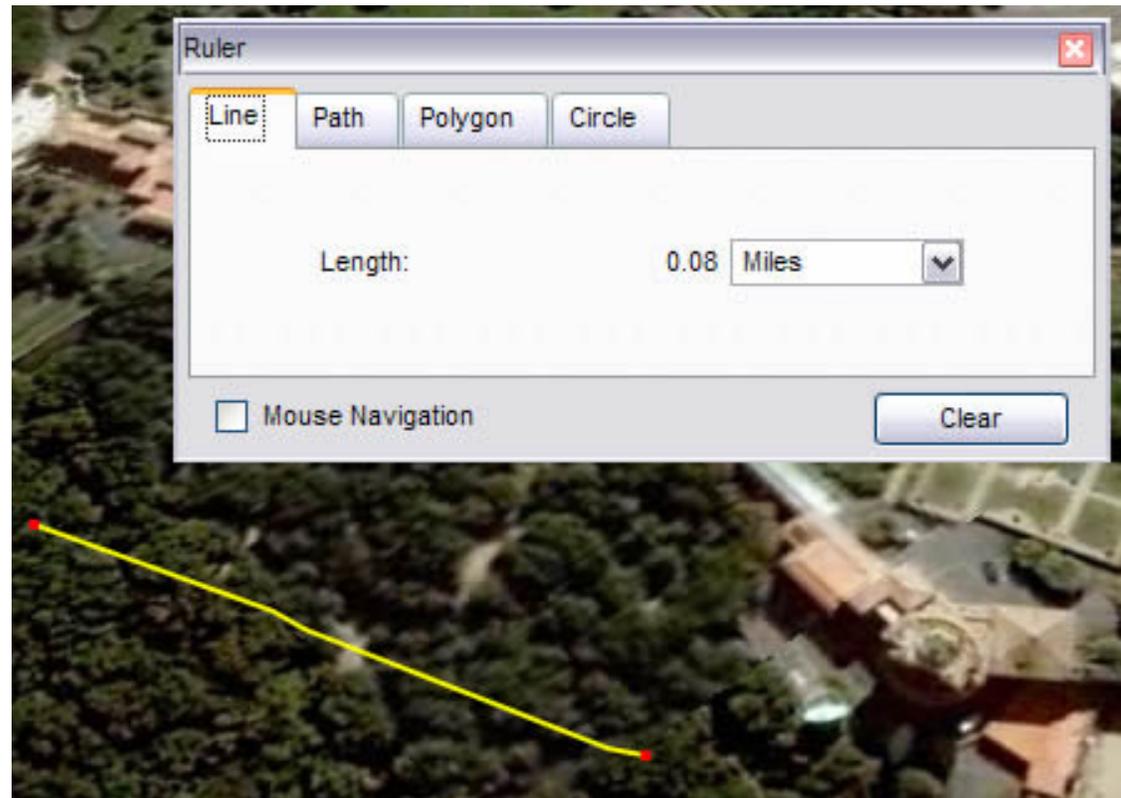
- [Measuring Tool Features and Options](#)
- [Available Units of Measure](#)

[Drawing Paths and Polygons](#)

Measuring Distances and Areas

Google Earth offers a number of tools that you can use to measure distances and estimate sizes. Depending upon which version of Google Earth you are using, you have access to the following measuring tools:

- Measuring with a line or path (all Google Earth versions)
- Measuring with a circle radius or polygon (Google Earth PRO)



Use the *Ruler* window (*Tools* menu) to measure length, area, and circumference as follows:

1. Position the imagery you want to measure within the 3D viewer and make sure you are viewing the earth from top-down (type U) and with terrain turned off for best accuracy. Measuring is calculated using the lat/lon coordinates from point to point and does not consider elevation.
2. From the Tools menu, select Ruler. The Ruler dialog box appears. Consider moving the dialog box to a region of your screen that doesn't obstruct the 3D viewer.
3. Choose the type of shape you want to measure with. All versions of Google Earth can measure with Line or Path. Google Earth PRO

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users can also measure using a polygon or circle.

4. Choose the unit of measure for length, perimeter, area, radius, or circumference, as applicable. See the table below for a list of supported units of measure.
5. Click in the 3D viewer to set the beginning point for your shape and continue clicking until the line, path, or shape measures the desired region. (For circle, click in the center and drag out to define the circle.)

A red dot indicates the beginning point of your shape, and a yellow line connects to it as you move the mouse. Each additional click adds a new line to the shape, depending upon the tool you chose. The total units for the shape are defined in the Ruler dialog box, and you can choose other units of measure for the existing shape.

For more details on how to modify the shape, reposition the viewer while measuring, and use other shape features, [see the features table](#).

Measuring Tool Features and Options

The following table describes the options available to all measuring tools, as well as the features specific to each tool.

Feature or Function	Description
Modify or reposition a shape	<p>Once you define a line, path, or other shape in the 3D viewer, you can change its dimensions by clicking on a desired point and dragging it to the new position. First make sure you have the type of shape you want to modify selected in the Ruler dialog box.</p> <p>When you place the cursor over an existing point, the cursor changes from a drawing box to a finger-pointing hand to indicate that you can click on the highlighted point if you want to reposition it.</p> <p>For circles, you can click on the radius point and drag the circle to a new position on the earth.</p> <p>For area shapes, you can add additional points by clicking in the 3D viewer. Points are added in an area shape in a strict sequence from first to last, regardless of where you click in the 3D viewer.</p>

Remove selected shape	If you want to remove a shape from the viewer, right click (CTRL click on the Mac) the shape in the Places panel and click Delete.
Remove selected point	If you want to remove a point from either a path or an area shape, select a point and press the <i>Backspace</i> key.
Remove all shapes	You can clear all measuring shapes from the viewer by clicking on the <i>Clear All</i> button in the <i>Ruler</i> dialog box regardless of which tab is active.
Reposition the viewer	By default, navigation with the mouse is disabled when you use measuring mode, but you can enable it by checking <i>Mouse Navigation</i> . When enabled, mouse navigation works in conjunction with measuring: click and <i>hold</i> to add a new point; click and <i>drag</i> to move the earth.
Line	All Google Earth versions support measuring with a line. A line consists of two points connected by a straight line, and measurement is done along its length.
Path	All Google Earth versions support measuring with a path. A path in the measuring mode consists of two or more points connected with a straight line. Measurement is done along the entire length of the path. To follow a natural boundary or road more closely, try zooming in closely to the feature and adding more points.
Polygon	Google Earth PRO version supports measuring with the polygon tool. A polygon consists of three or more points. Measurement for a polygon tool is done for both perimeter and area.
Circle	Google Earth PRO version supports measuring with the circle tool. Measurement for a circle is done for its radius, area, and circumference (in the appropriate measurement unit).

Available Units of Measure

The following table describes the units of measure available for length, perimeter, area, and radius.

Measurement Type	Units Available
------------------	-----------------

Length, Perimeter, and Radius	Centimeters
	Meters
	Kilometers
	Inches
	Feet
	Yards
	Miles
	Nautical Miles
	Smoots
Area	Square Meters
	Square Kilometers
	Hectares
	Square Feet
	Square Yards
	Square Miles
	Square Nautical Miles
	Acres





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Drawing Paths and Polygons

Note - This feature set is available to users of the Google Earth PLUS or Google Earth PRO products. Visit <http://earth.google.com/products.html> for more information.

You can draw free-form paths and polygons in the 3D viewer and save them in your *My Places* folder just as you would a placemark. Paths and polygons share all the features of placemark data, including name, description, style view, and location. For more information on modifying paths and polygons once you create them, see [Editing Places and Folders](#).

Follow the steps below to draw a path or polygon in the 3D viewer.

1. Position the 3D viewer to best contain the region you want to mark. The more detailed your view, the more closely your drawing can follow the land feature. From the Add menu, select *Path* (Ctrl + Shift + T) or *Polygon* (Ctrl + Shift + G). The New Path or New Polygon dialog box appears and the cursor changes to a square drawing tool. Enter the properties for your drawing just as you would for any other type of places data. See [Editing Places and Folders](#) for details.

Hint: Change the style color (Style, Color tab) for the line or polygon from the default white to better visualize the shape you are about to try. Click in the viewer to start your drawing and use the following methods to achieve your desired shape:

- **Free-Form shape** - Click once, *hold*, and drag. The cursor changes to an up-arrow to indicate that you are using free-form mode. As you drag the cursor around the 3D viewer, the outline of the shape follows the path of your cursor. If you are drawing a path, a line appears as a result, and if you are drawing a polygon, a shape evolves from the path of your cursor, always connecting the beginning and ending points.
- **Regular shape** - Click and release. Move the mouse to a new point and click to add additional points. In this mode, the cursor remains a square drawing tool, and the path or polygon that you draw is exactly the same as the path and polygon creation described in [Measuring Distances and Areas](#).

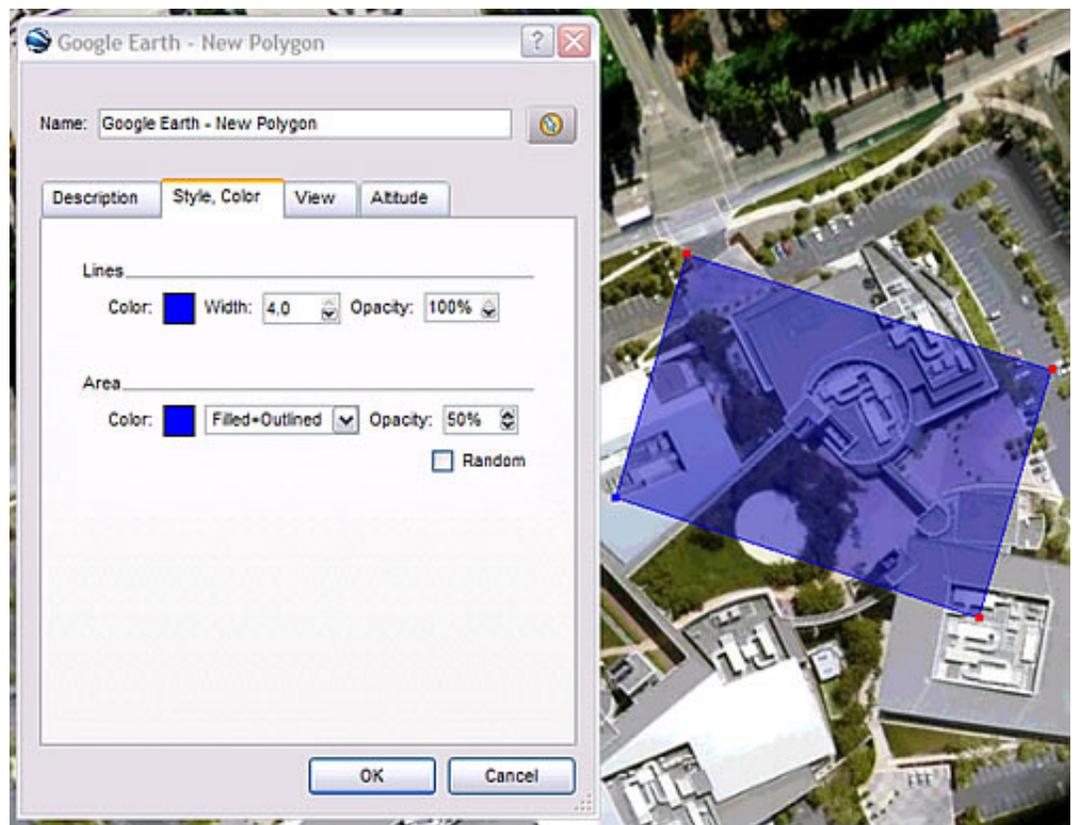
You can use a combination of these drawing modes to combine curved edges with straight edges. To transition from a free-form mode to a regular mode, just release the mouse button, position the pointer to a new place, and click. A straight edge is drawn between the last point and the most recent one. Reverse the process to enter free-form drawing mode again.

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Hint: To navigate in the 3D viewer while creating a new path or polygon, use the keyboard controls or the [navigation panel](#).

2. If you are creating a polygon, you can make the shape a 3D object. To do this:
 - a. Click the *Altitude* tab.
 - b. Slide the slider from *Ground* toward *Space*. This elevates the polygon. Elevate the shape to the appropriate height.
 - c. Check *Extend sides to ground*. The polygon is now a 3D object. [Learn more about placing other 3D objects](#).
3. Click *OK* to save your new path or polygon.





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Using Image Overlays and 3D Models

With Google Earth, you can place custom images and Google SketchUp 3D models over the view of the earth. Image overlays provide additional information about the underlying earth imagery. For example, you can:

- **Use a map of satellite weather data** that updates to reflect the most recent weather imagery for that region.
- **Use imagery of a site plan and parcel boundaries** to view the development stages over a particular parcel.
- **Use publicly available image maps** (or create your own image maps) for such things as hiking trails, camping spots, theme parks, fishing locations, national park boundaries, and more.

Google SketchUp is software that allows users to create 3D models and share them with others. For more information about Google SketchUp, [visit the product home page](#). Also refer to the following topics:

- [Placing Google SketchUp 3D Models](#)
- [Viewing Google SketchUp 3D Models](#)

About Overlays

When you create an image overlay, you are specifying three important things:

- **What image file to display** in the 3D viewer (from your computer, from your network, or from a website)
- **How to fit or position the image boundaries** to the earth data beneath
- **What the location and view** of the imagery overlay is (in the same way you do when positioning a new placemark)

The topics in this section cover:

- [Overlay Requirements](#)
- [Overlay Features](#)

[Drawing Paths and Polygons](#)

Using Image Overlays and 3D Models

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Overlay Requirements

Overlay images can be taken from your computer, from your network, or from a web site. The image format must be:

- JPG
- BMP
- TIFF
- TGA
- PNG

Overlays in PNG format can be modified so that undesirable regions (such as image boundaries) are transparent, letting the underlying imagery show through.

You can use topographical maps, weather satellite image maps, or other geographical image data as overlays. For ideas and examples of overlays, see the Google Earth Community bulletin board (bbs.keyhole.com).

The overlay image itself must have a North-Top orientation with simple cylindrical projection. Simple cylindrical projection (or Plate Carrée) is a simple map projection where the meridians and parallels are equidistant, straight parallel lines, with the two sets crossing at right angles. (This format is also known as Lat/Lon WGS84 projection.) Because a certain amount of modifications to overlay images is allowed, you might find that the more common UTM maps work well enough over small areas. However, for a more precise overlay of a large region, simple cylindrical projection is required.

Note - The overlay feature is memory intensive. Consequently, images larger than 2000x2000 pixels can reduce the performance of Google Earth and other applications currently running on your computer. (To determine the size in pixels of an image, display the image file in a Windows Explorer window, right-click (CTRL click on the Mac) on it, and select *Properties* from the pop-up menu.) If you are having trouble importing a large image, you can reduce its size using image editing software such as Adobe Photoshop.

Overlay Features

Once you create an overlay, it has many of the same features available to it as a simple placemark. With overlays, you can:

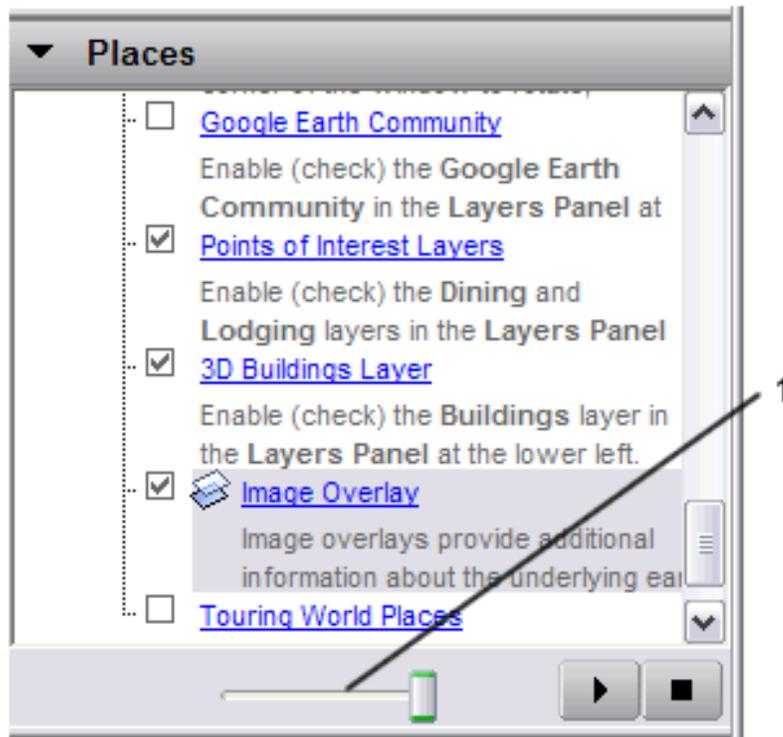
- **Email them to other people** - You can email image overlays just as you would mail other placemark data. However, keep in mind that overlay files can only be opened by other users of Google Earth. If you want to send the overlay image as it appears on the earth to someone who doesn't have Google Earth, email the view instead. For details on emailing overlays, see [Emailing Places Data](#).

When you email an overlay that references a local image, that image is automatically included with the overlay. You do not need to include the local image in your email attachment. This is an upgrade from Google Earth (Keyhole) version 2.2 and earlier.

- **Save them to your computer.** See [Saving Places Data](#) for details.
- **Edit their properties and settings** - See [Editing Places and Folders](#) for relevant information.

In addition to common placemark features, image overlays also have the following features:

Transparency Adjustment - You can adjust the transparency of an overlay from completely transparent to fully opaque whenever it is selected in the viewer. By adjusting the transparency of the overlay image, you can see how the overlay image corresponds to the 3D viewer imagery beneath.

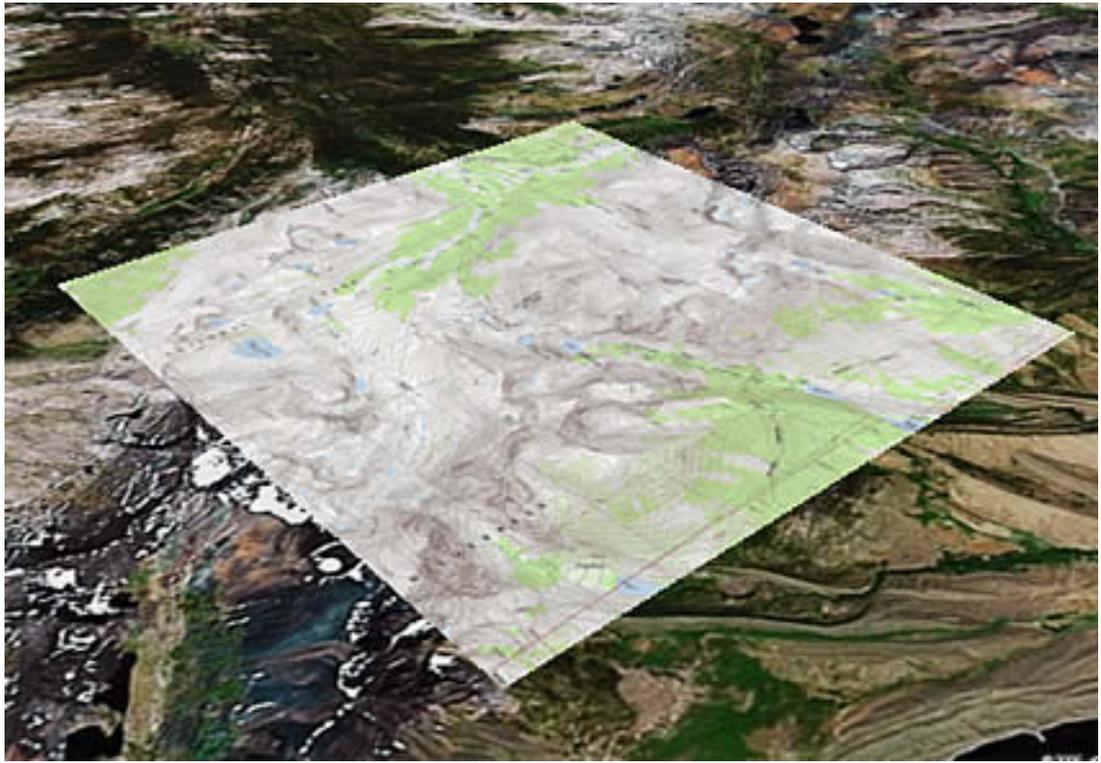


1. Overview slider for selected overlay

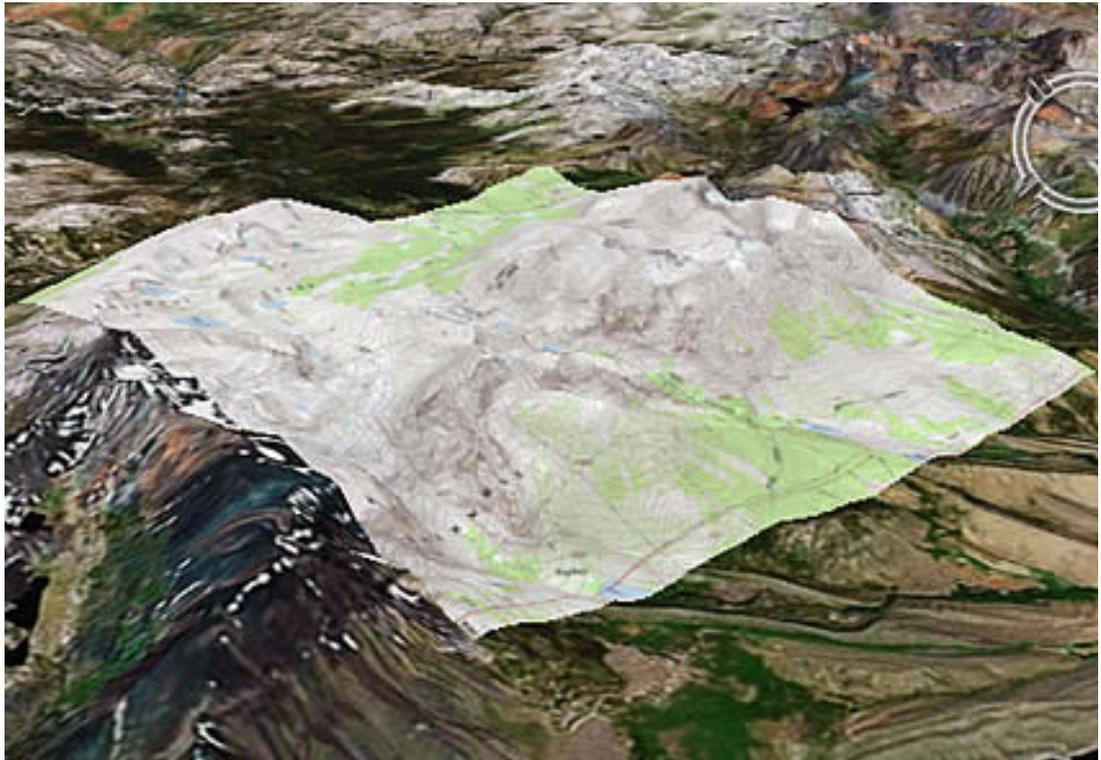
Note - You can also adjust the transparency of a selected overlay if your mouse has a scroll wheel. Click the slider (see above). Scroll down to make the overlay more opaque. Scroll up to make the overlay more transparent, .

Terrain Integration

When you create an overlay, it completely integrates with the terrain or shape of the land beneath if the terrain layer is turned on. For example, you might create an overlay of Yosemite National Park and be able to view the trails in relationship to the 3D view of the mountains. In this way, the combination of an overlay map and the 3D viewer imagery gives more information than either one by itself.



Overlay map with terrain off



Overlay map with terrain on

- **Updates based on time or view coordinates** - If you are viewing

time-sensitive imagery that changes periodically, you can set the imagery to a refresh rate to make sure you are viewing the latest image. This is useful for viewing imagery maps from the web where the image is automatically updated.

In addition, you can set the imagery to update depending upon your view. For example, you might be viewing imagery from a server that only delivers imagery that can be seen in your current 3D view. In this case, the imagery update changes whenever you navigate the 3D viewer to a new position.

- **Draw Order** - When using multiple image overlays on the same region, you can set a drawing order to control which image is viewed on top of the "stack." This is useful for visualizing site plans where different overlays represent different phases in the plan. This feature is available only to Google Earth PRO/EC users.

Creating an Image Overlay

This section covers three parts to creating an image overlay:

- [Creating an overlay](#)
- [Positioning the imagery in the viewer](#)
- [Position settings](#)

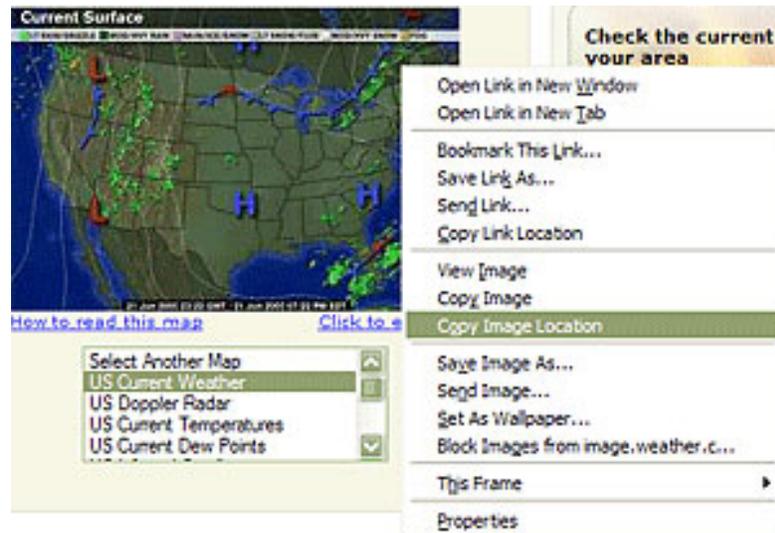
Creating an overlay

1. Position the 3D viewer in the location where you want to place the overlay image file.

Try to position the viewer so that it corresponds in viewing altitude to the overlay. If the overlay is of a detailed view, [zoom into the subject area](#) so that you don't have to make large adjustments later. By contrast, if the overlay covers a large area, make sure the entire area is encompassed in the 3D viewer with some margins for adjusting the imagery.

2. Select *Image Overlay* from the *Add* menu (or use other shortcut methods described in [Creating A New Placemark](#)). The *New Image Overlay* dialog box appears.
3. Provide a descriptive name in the Name field.
4. In the Link field, enter the location of the image file you want to use as an overlay or use the *Browse* button to locate it on your computer or network.

If the image you are referencing is located on the Web, you will need to enter the URL for that image file. *This is different from the URL for the web page itself!* If you are using Internet Explorer, you can retrieve the URL for an image by right-clicking on the image on its web page and selecting *Copy Shortcut* from the pop-up menu. At that point, you can insert your cursor in the *Image URL* or *Filename* field and paste the information using Ctrl+V (⌘ on the Mac).



The image appears in the 3D viewer, with anchor points that you use to position it.

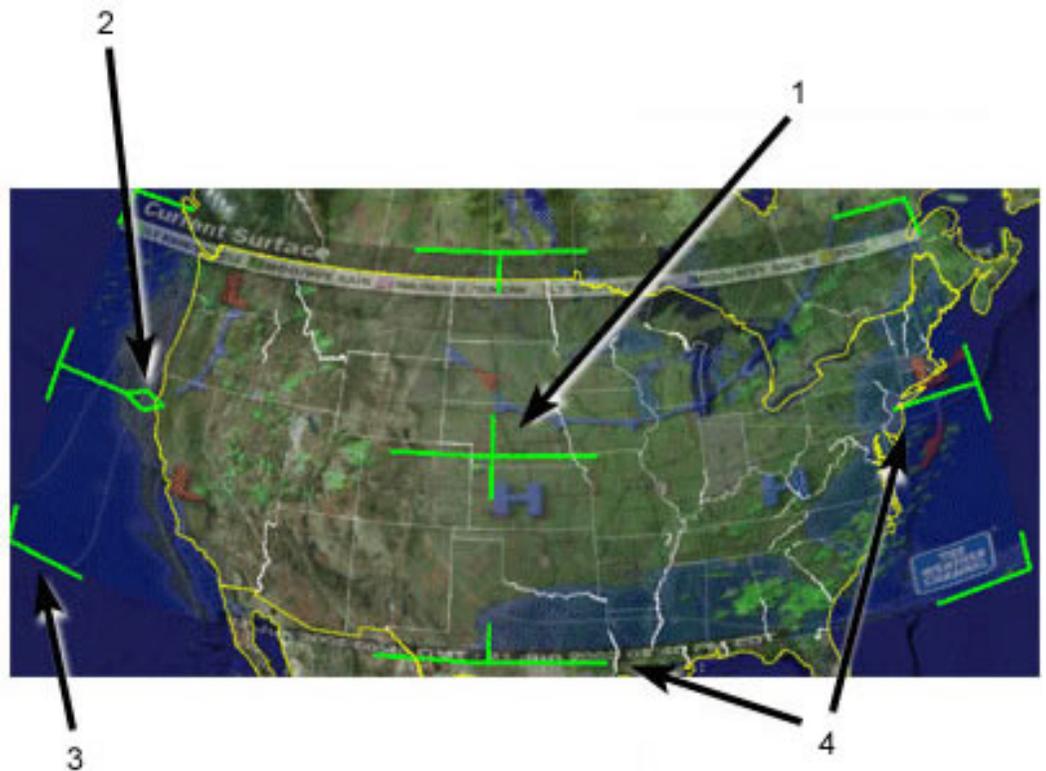
5. Specify the descriptive information for the overlay. Descriptions for overlays are identical to descriptions for all places data. See [Writing Descriptions](#) for details.
6. Click the Refresh tab and set the correct refresh properties for your overlay imagery. The refresh settings for overlays are identical to those described for network links. Typically, any imagery that is updated automatically and located on a server will need refresh properties set. For example, weather satellite image maps will likely need to be refreshed. For details on the differences between time-based and view-based refresh, see the [description for network links](#).
7. Set the default transparency for the imagery using the slider. The transparency setting for image overlays can be adjusted at any time when you are viewing an overlay. To make it easy to position the overlay, first adjust the transparency to achieve a good balance between seeing the imagery and the earth beneath it.
8. When you select the View tab, you can modify the view settings for the overlay just as you would any place data. See [Setting the View](#) for details.
9. Position the image in the viewer to your preferences and click OK to complete the creation. If you later want to correct the overlay or

reposition it, simply edit the overlay as you would any other places data. See the topics in [Editing Places and Folders](#) for more information.

Positioning the imagery in the viewer

Once you have inserted the overlay image into the viewer, you can use the green markers to stretch and move the image in a number of ways to get the most exact positioning required. An overlay image will have corner and edge marks that you can use to stretch the image, a central cross hair marker to position the image, and a triangle marker that you can use to rotate the image.

When you select one of these markers, the cursor changes from an open hand to either a finger-pointing hand or an arrow to indicate that an anchor point is selected. The following illustration describes the anchor points in detail.



1. Use the center cross-hair marker to slide the entire overlay on the globe and position it from the center. (Tip: do this first.)
2. Use the triangle marker to rotate the image for better placement.
3. Use any of the corner cross-hair markers to stretch or skew the selected corner. If you press the Shift key when selecting this marker, the image is scaled from the center.
4. Use any of the four side anchors to stretch the image in or out of

from the selected side. If you press the Shift key when doing this, the image is scaled from the center.

Tip - Try positioning the center of the image as a reference point first, and then use the *Shift* key in combination with one of the anchors to scale the image for best positioning.

Position settings

When you select the *Location* tab, you can use the following settings:

- **Manual coordinates for each corner of the image overlay.** This is similar in principle to the manual setting discussed in [Repositioning Placemarks](#), except that instead of setting coordinates for a single point, you set coordinates for each corner of the image overlay. You might want to use this feature if your image overlay comes from a precise map where the exact coordinates are known.
- **Draw Order** - If you have more than one overlay for a given region, you can set the draw order for overlays to determine which image is displayed relative to other images. Overlays with higher numbers are drawn before those with lower numbers.
- **Fit to Screen** - Click this to resize the image to fit the current view.

When you select the View tab, you can modify the view settings for the overlay just as you would any place data. See [Setting the View](#) for details.

Opening and Viewing Overlays

In addition to the overlays you create, you can also open and view overlays emailed to you by other Google Earth users, or you can view overlays posted to a web server.

Opening Overlays Emailed to You

Opening overlays emailed can be done in two ways:

- **Double-click on the attachment in the email message.** You'll receive a confirmation dialog box to open the attachment in Google Earth. Click the appropriate button to open the attachment. If Google Earth is not running, it will first start up before loading the emailed overlay. Otherwise, it appears in the *Temporary Places* folder in the *Places* panel and the image overlay displays in the viewer. You can save the overlay as you would any other

place data. See [Saving Places Data](#).

- **Save the attachment to your computer.** You can save the overlay file to your computer and open it at your convenience as you would any other type of places data. See [Opening Saved Placemarks](#) for details.

Opening Overlays on a Web Server

You can open overlays posted to a web server simply by clicking on the link that references the overlay image. When you do this, a dialog box prompts you to select the correct application to open the attachment. By default, Google Earth should be selected. Click the appropriate button to confirm the selection. The image overlay appears in the 3D viewer and the item is displayed in the *Temporary Places* folder in the *Places* panel. You can save the overlay as described above.

Posting Image Overlays to a Web Server

You can share overlay data with other Google Earth users by posting the overlay file to a web server that other users also have access to. For example, Google Earth users can post overlays and placemark information to the Google Earth Community BBS (bbs.keyhole.com). The rest of this section covers the details of posting overlay data to the Google Earth BBS.

Note - You can post overlays to the Google Earth Community BBS regardless of whether they reference local or web-based imagery data. Overlays that you post to the BBS will automatically include images referenced from a local file system. This is an upgrade from Keyhole 2.2.

1. Right-click (CTRL click on the Mac) on your overlay and select Save As... from the pop-up menu.
2. Navigate to a location on your computer's hard drive using the Save dialog box, name the file, and save it.
3. Use a web browser to connect to bbs.keyhole.com. You must be a registered user of the Google Earth Community to post overlay files. If you are a first-time user of the Google Earth software, you must first register with the Google Earth community before you can log in and post placemark files. This registration is a separate process from your Google Earth subscription and is free of charge:
 - Once on the Google Earth BBS, click on the registration link in the Login area.
 - Follow the on-screen instructions to register on the site.

- You need to provide your email address in order to activate your account. After registering, an email will be sent to that address containing your registration information and an activation link.
 - Click on the link provided in your account activation email. Your bulletin board account is activated, and you have full access to all of the features of the Google Earth BBS.
4. Log on to the Google Earth Community web site.
 5. Choose a forum (threaded discussion) that is relevant to your image overlay posting.
 6. Click the *Post* link in the forum subheader.
 7. Enter information in the *Subject* and *Post* fields, select the check box next to "I want to preview my post and/or attach a file" and click the *Continue* button.
 8. Preview your posting and attach an overlay file by clicking on the *Browser* button and navigating to the file.
 9. Click the *Continue* button to post your message and file.

Placing Google SketchUp 3D Models

To place a Google SketchUp 3D model in Google Earth:

1. Click Add > Model or press Ctrl + Shift + M (⌘ + Shift + M on the Mac). The New Model dialog box appears. Adding a model is very similar to [adding a placemark](#).
2. Altitude settings for 3D models are identical to placemark altitude settings. For more information, see [Setting Altitude](#).

For additional information:

- [Viewing Google SketchUp 3D Models](#)
- [Using Google SketchUp with Google Earth](#)





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Using GPS Devices with Google Earth

If you have a GPS (Global Position System) device, you can connect it to your computer and import your waypoint and track data into Google Earth. Note that this set of features is available to users of Google Earth Plus, Google Earth Pro and Google Earth EC, but not the free version (see [Google Earth Products](#)). Topics in this section include:

- [Supported Devices](#)
- [Required Connectors](#)
- [GPS Point Translation](#)
- [Importing GPS Data](#)

Supported Devices

Google Earth currently supports most GPS devices from the following manufacturers:

- [Garmin](#)
- [Magellan](#)

The [GPSBabel web site](#) lists the devices officially supported by the Google Earth GPS import feature. You can try other devices, but they might not work correctly.

Required Connectors

You need either a serial or USB cable to connect the GPS device to your computer. Typically, your device is sold with one type of cable. If your GPS device did not come with a cable, you can visit the manufacturer's web site to purchase the correct one for your model.

GPS Point Translation

When your GPS data is imported into Google Earth, it is categorized

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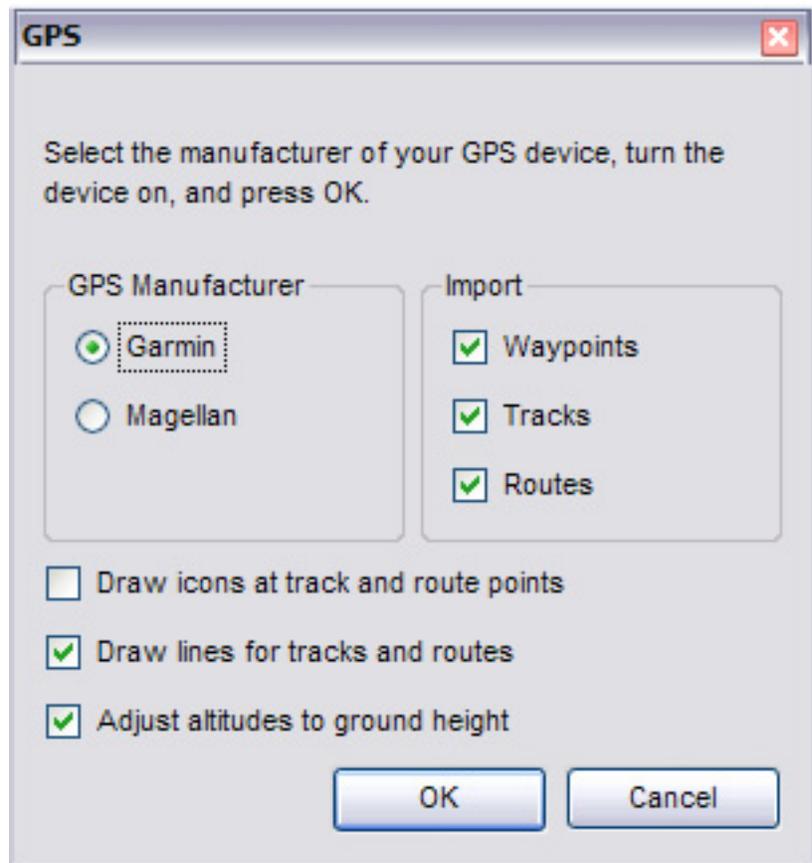
into three possible folders, depending upon the type of point. These folders are:

- **Tracks** - Tracks (or trackpoints) are the points automatically recorded by the GPS device periodically along the recorded route. They can be imported into the Google Earth application as paths. **Waypoints** - Waypoints are points entered manually by the user and typically marked with a name, such as "home" or "turnaround point."
- **Routes** - Route points are those points that the GPS device uses to creating the routing, such as when you instruct the device to "go to" a recorded point from another recorded point. Route points can contain multiple connected "go to" instructions. They can be imported into the Google Earth application as paths.

Importing GPS Data

Importing the data from your GPS to Google Earth is simple:

1. Connect your device to the computer running Google Earth.
You can use either a serial cable or USB cable, depending upon which one came with your device.
2. Turn on the GPS device. Once your device is on and activated, it is not necessary to wait until it connects to satellites.
3. From the *Tools* menu, select *GPS*. The *GPS* window appears.



4. Select the correct manufacturer type for your device.
5. Select the types of data you want to import.
6. Choose your drawing preferences. By default, tracks and routes are set to draw as lines, but you can select *Draw icons at track and route points* if you want an icon to be displayed in the 3D viewer for every track/route point recorded by your GPS device.
7. Adjust your altitude preferences. Select the *Adjust altitude to ground height* check box to adjust all recorded point to ground level, such as when importing a track taken on foot, car, or bike. However, if your GPS track was recorded while hang gliding or flying, make sure this option is not selected so that your points will appear as above-ground points.
8. Click OK. When your GPS data is finished loading into Google Earth, a confirmation dialog box appears.

Your data appears in the *Places* panel with the label *Garmin GPS Device* or *Magellan GPS Device*, depending upon the device used (see [Supported Devices](#)). If you expand that folder, you can see the data sorted into the appropriate folders depending upon the type of data, as illustrated in the example below.



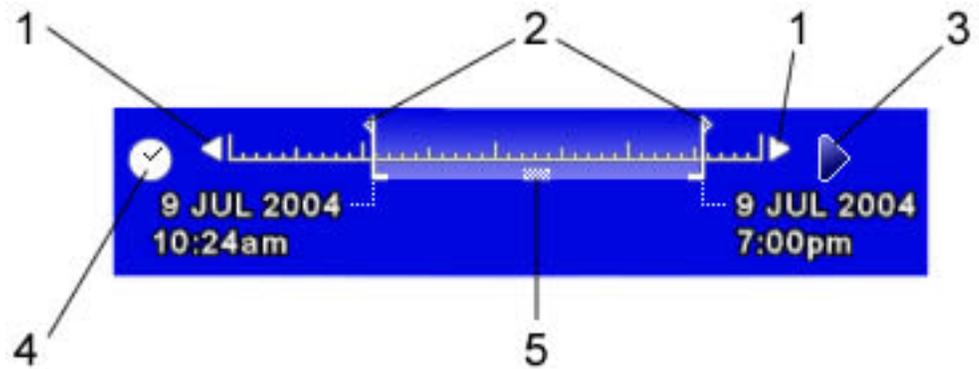
You can expand those folders and explore the information within as you would any other type of places data. This includes organizing, editing, sharing, saving, and more.

Note - If you receive a connection error, turn off the GPS device, turn it on again, and start again from Step 3 above.

Viewing a Timeline

If you have downloaded data that contains time information (for example, GPS tracks), you can view this information sequentially in Google Earth. For example, you can view GPS tracks that occurred within a specific time period and visually follow these tracks. To do this:

1. If necessary, [import the GPS data](#) or other time-related data.
2. In the Places panel, select this data. The time slider appears at the top of the 3D viewer with a time range that corresponds to the data you selected.
3. Do any of the following:
 - To re-define the time range of data displayed in the 3D viewer, drag the range markers ([see below](#)) to the right or left.
 - To move the time range earlier or later, either drag the center tab of the range in the time slider or click the small white arrows near the ends of the time slider ([see below](#)).
 - To play an animation of the sequence, click the Play button ([see below](#)). Note that this is only useful if only a portion of the data is defined in the time range.



Features of the Time slider include:

1. Click these arrows to move the time range earlier or later.
2. Drag these range markers to the right or left to re-define the time range of data displayed.
3. Click this to play an animation of the sequence. This works best if you move the range markers to define a time range smaller than the whole set.
4. Click this to set [options for the time slider](#).
5. Drag this to move the time range earlier or later.

Setting Timeline Options

You can set options for the [timeline display feature](#). To do this:

1. In the time slider, click the clock icon ([see above](#)). The Time dialog box appears. Options include:
 - **Display Time In** - Choose the appropriate type of displayed time.
 - **Clamp to beginning of window** - Check this to keep the beginning of the displayed time range glued to the left side of the time slider. This helps you display a time sequence while leaving the earliest data visible throughout the animation.
 - **Animation speed** - Use this slider to set the speed of the animation that occurs when you click the play button on the time slider ([see above](#)).
 - **Repeat mode** - Choose how you would like to play the animation: *Wrap* (play continuously), *Once* (play one time), *Bounce* (play back and forth continuously).

.....
2. When you are finished, click **OK**.



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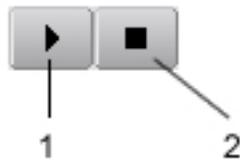
Touring Places

- [Setting Which Items Are Toured](#)
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Touring Places

In addition to touring directions, you can tour items in your *Places* listing by selecting the check box next to items you want to tour and clicking on the *Play Tour* button at the bottom of the *Places* panel. The tour begins playing in the 3D viewer, which flies to each location and stops for a period of time before flying to the next place in the list. To stop the tour, click the *Stop Tour* button beneath the *Places* listing.



1. Play Tour button
2. Stop Tour button

You can control which items are visited in your tour, as well as the touring behavior itself, as described in the following topics:

- [Setting Which Items Are Toured](#)
- [Setting Touring Behavior](#)

Setting Which Items Are Toured

	Action Required	Result
Tour all checked items	Place a checkmark next to all placemarks, overlays, and paths that you want to tour. Click the <i>Play Tour</i> button (bottom of the <i>Places</i> panel). 	All items that have a checkmark next to them are visited in the tour, beginning with the first one in the list.

- [Folders](#)
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- [Drawing Paths and Polygons](#)
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<p>Tour only one folder or item.</p>	<p>Check the appropriate folder or item. Uncheck all other folders and items in the Places folder.</p> <p>Click the <i>Play Tour</i> button (bottom of the <i>Places</i> panel). </p>	<p>Only individual placemarks, overlays, and lines within a folder are toured. Everything else is ignored by the tour even if it is checked.</p> <p><i>Note:</i> This also includes any subfolders within the parent folder.</p>
<p>Touring Directions or Paths</p>	<p>Check the folder containing the directions or path(s) you want to tour. (Directions can be listed in the <i>Directions</i> tab or saved to <i>My Places</i>.) Uncheck all other folders and items in the Places folder.</p> <p>Click the <i>Play Tour</i> button (bottom of the <i>Places</i> panel). </p>	<p>The path or route is followed in the 3D viewer.</p>

Setting Touring Behavior

Touring Speed

You can modify touring speed, which controls how fast the viewer "flies" to each stop in the tour. Keep in mind that setting the tour to a high speed requires that your cache contain all imagery, or else the earth, road, and placemark imagery will not be streamed quickly enough to keep up with the tour.

1. Windows/Linux: Click *Tools > Options*. Mac: Click *Google Earth > Preferences*.
2. Click on the *Touring* tab.
3. In the *Fly-To/Tour Settings* area, adjust the speed accordingly.

Pause Time at Each Stop

You can set the desired pause time for each stop in the tour.

1. Windows/Linux: Click *Tools > Options*. Mac: Click *Google Earth > Preferences*.
2. Click on the *Touring* tab.
3. In the *Fly-To/Tour Settings* area, adjust the *Tour Pause* slider in seconds, from 0 to 60, or enter any number in seconds.

Number of Loops

By default, the tour will perform one pass of the selected items. However, you can control how many times the tour is played.

1. Windows/Linux: Click *Tools > Options*. Mac: Click *Google Earth > Preferences*.
2. Click on the *Touring* tab.
3. In the *Fly-To/Tour Settings* area, adjust the *Play Tour* selector by pressing the arrow or entering the number of times you want the tour replayed.

You can also select Infinite by clicking on the down arrow from a start position of 1.

Driving Directions/Touring Path Options

You can determine the angle of view, speed, and camera distance from each point in the driving directions with these settings.

Tip - If you adjust the range to a smaller number, the tour follows paths with multiple points more closely, providing a realistic appearance.

1. Windows/Linux: Click *Tools > Options*. Mac: Click *Google Earth > Preferences*.
2. Click on the *Touring* tab.
3. In the *Driving Directions Tour Options* area, adjust the controls for tilt, range, and speed to your preferences.



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Editing Places and Folders

Once you have become familiar with the basic steps involved in creating and organizing places and folders, you can use this section to learn how you can further modify the appearance of places and folders that you have saved. You can edit the style settings, position, and view for an individual placemark or a folder that contains place data.

To do this, right-click (CTRL click on the Mac) on the icon or folder in the *Places* panel and select *Properties* from the pop-up menu. The *Edit* dialog box for that item appears. Enable the relevant *Style*, *Location*, and *View* properties for the folder or placemark.

Note - Elements in the Style tab dynamically update to reflect the type of place data being selected.

To learn about these features and how they apply to folders and individual items, see the following topics:

- [Repositioning Placemarks](#)
- [Setting the View](#)
- [Writing Descriptions](#)
- [Changing Labels](#)
- [Setting Icons for Places and Folders](#)
- [Setting Line Color and Width](#)
- [Setting Altitude](#)
- [Modifying Folder Settings](#)
- [Modifying Settings for a Single Item](#)

Repositioning Placemarks

When editing placemarks or geometry, you might want to reposition their location on the earth. The *Edit Placemark* dialog box offers a number of ways to [reposition a placemark](#).

Dragging the Placemark

When you edit a placemark, a yellow square appears around the icon, indicating that you can reposition the icon if you desire. Just click within the square and drag the icon to the new location. If you need to move the earth to get a better view of the icon relative to other things, position the mouse outside the square to move the 3D viewer.

You can also [lock the placemark to the center of the view](#).

Locking a Placemark to the Center of the View

With this feature, you reposition the earth under the placemark, rather than repositioning the placemark over the earth. This feature is useful if you want to move a placemark a distance that extends beyond the view, and using drag and drop is inconvenient as you switch from dragging the icon to repositioning the earth.

Click on the *View* tab and select the *Center in View* check box. When you choose this option, the

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placemark moves to the center of the 3D viewer and cannot be repositioned by dragging. Instead, you position the icon by *dragging the earth*, which then moves independently of the placemark. This feature allows you to easily position an icon to a new location beyond your current screen space.

Entering Advanced Coordinates

If you know the latitude and longitude for the placemark you are editing, click the View tab and enter coordinates to reposition the geographic point for the placemark. The placemark adjusts its position to the new values.

Latitude and Longitude values can be set using the following notations:

- **Decimal Degrees (DDD)** In this notation, decimal precision is set in the *degree* coordinate. For example, 49.11675953666N.
- **Degrees, Minutes, and Seconds (DMS)**. In this notation, decimal precision is set in the *seconds* coordinate. For example, 49 7'20.06"N.
- **Degrees, Minutes with Decimal Seconds (DMM)** In this notation, decimal precision is set in the *minutes* coordinate. For example, 49 7.0055722"N. (Here, 20.06 seconds above is divided by 3600 to get the decimal minute value for 20.06 seconds.)

Latitude and Longitude syntax is specified as follows:

- **Numeric Values** - Simply separate each coordinate notation with a white space and the entry will be recognized correctly. For example, you can indicate a DMS notation as: 37 24 23.3. You could indicate a DMM notation as 49 7.0055722.

You can also use the single quote mark (') for minutes and the double quote mark (") for seconds, as follows: 49 7'20.06"

Alternatively, you can use the Character Map utility in Windows to copy the degree symbol and paste it into the Latitude/Longitude input boxes. To do this, select Start - All Programs - Accessories - System Tools, and then click Character Map. The degree symbol with Arial font is the second entry past the registration symbol. Click on the symbol, click the Copy button and paste it into the input box.

On the Mac, open TextEdit. Press Shift + Option +8. The degree symbol appears. Copy and paste this into the input box.

- **Direction Notation (North/South, East/West)**

Use *N*, *S*, *E*, or *W* to indicate direction. The letter can be entered either upper or lower case and it can be placed before or after the coordinate value. For example:
N 37 24 23.3 is the same as 37 24 23.3 N

You can also use the minus sign (-) to indicate a westerly or southerly position. When you use this kind of notation, do not specify a letter symbol. Additionally, you do not need to use a plus sign (+) to indicate northerly/easterly directions. So, for example this is a valid entry:
37 25 19.07, -122 05 08.40

The following is NOT a valid entry:
37 25 19.07 N, -122 05 08.40

- **Entering Latitude, Longitude Pairs**

When entering latitudinal or longitudinal pairs, the first coordinate is interpreted as latitude unless you use a direction letter to clarify (E or W). For example, you can enter longitude first as:
122 05 08.40 W 37 25 19.07 N

However, you cannot use the minus sign to enter longitude first:
-122 05 08.40 37 25 19.07

You can separate pair entries with a space, a comma, or a slash:

37.7 N 122.2 W
37.7 N,122.2 W
37.7 N/122.2 W

Tip - When entering advanced coordinates, the location for your placemark will adjust as soon as your cursor exits the input box, but the view will remain the same. Your placemark will seem to disappear from view. To see the placemark in the 3D viewer, click the *View* tab and click the *Reset to default view* button. Your 3D viewer will now be positioned over the placemark in its new location.

Setting the View

When you create a new placemark, the view for that placemark (i.e., how it is seen in the 3D viewer) is automatically set to the current view on creation. However, you can change the view for any placemark and save it so that each visit to the placemark shows the saved view. This involves specifying a particular orientation around a given place and then setting the orientation.

For example, after first viewing a particular place, you might subsequently find a position that you like to view it from, such as at a specific tilt angle and from a southerly direction. Rather than the default north-south, overhead viewpoint of a location, you can specify your preferred position as the view for every time you visit.



Top-down, north up view



Tilted and rotated view

Setting a view for a folder serves a different purpose than for an individual item.

Applying a New View

First, position the 3D viewer at the viewing orientation you desire and then choose one of the following options:

- **Right-click (CTRL click on the Mac) on the item** in the list view or the 3D view and select *Snapshot View* from the pop-up menu.

The current view inside the Google Earth client 3D viewer is then set as the view for the selected placemark or folder. You can examine the actual settings for the view by editing the placemark or folder and clicking on the *View*.

- **Edit the placemark or folder** - Right-click (CTRL click on the Mac) on the folder or icon and select *Properties* from the pop-up menu. Click on the *View* tab in the Edit... dialog box. The current values for the view are displayed. When you are ready to set the view (you can still position the view at this point), click on the *Snapshot current view* button.

Alternatively, you can manually enter the settings if you have them. Click the *OK* button to see the changes in the 3D viewer.

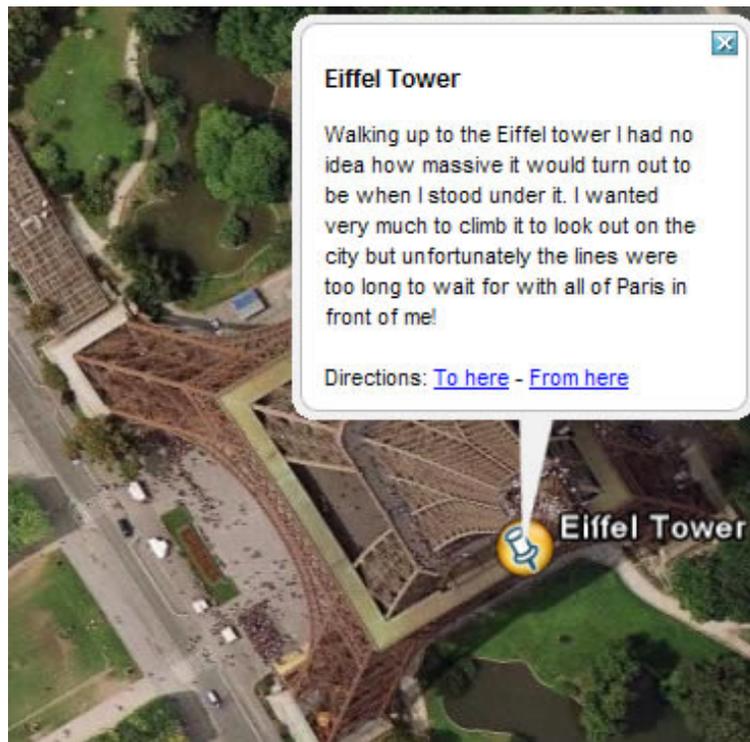
Note - When you change the values for a view, the 3D viewer changes *only the view* for the selected item, not the position of the placemark (or folder) itself. Conceivably, you could even set the view for a placemark so that the placemark icon is not visible in the 3D viewer.

Returning to the Default, Top-Down View

Right-click (CTRL click on the Mac) on the folder or icon and select *Edit...* from the pop-up menu. Click on the *View* tab in the Edit... dialog box. Click the *Reset view*. The view updates to the default orientation for the selected item.

Writing Descriptions

The description field for places and folder can contain a lengthy amount of text, sufficient for detailed descriptions. When you click on a placemark icon in the 3D viewer, the description for that place appears in the information balloon that pops up. A scroll bar appears when the description is too long to fit in the entire balloon.



In the *Places* panel, a small amount, or snippet, of the description appears beneath the folder or item.



Keep in mind the following points about text in the Description field:

- **Valid web URLs** are automatically converted to HTML and can be clicked on from the info balloon to produce the related web page in the web window.
- **Carriage returns** in the description are treated as HTML line breaks.
- **Many HTML tags are respected**, such as font, style, and table tags. If you are familiar with

HTML, you can be quite creative in how your descriptions are formatted! All HTML tags should be properly closed.

- **You can include images in your description** using the IMG HTML tag to refer to either:
 - Images stored on your computer's hard drive (e.g., ``)
 - Images on the internet (e.g. ``).

When you email that placemark to another person, local images are included.

Note - While theoretically the amount of text that you can enter into a description is unlimited, an extremely lengthy description can negatively impact the performance of Google Earth.

Changing Labels

When you [create or edit a placemark or folder](#), you can change the label for that item by typing in your text in the *Name* field. By selecting the *Style*, *Color* tab in the *Edit Placemark* dialog box, you can also change the following features for a label.

- **Color** - To set the color for a label, click on the *Color* swatch and choose a color using the standard color selector. You can choose preset colors or define your own in a variety of ways. When you select this color, the label updates before the *Edit* dialog box is closed, so you can view your changes and modify them easily.
- **Size** - To change the display size for a label, enter a value in the *Scale* field or click on the *Scale* button and use the slider to adjust the size of the label to your preference. The maximum scale value for an icon is 4 pixels.
- **Opacity** - The opacity setting indicates how transparent the label is relative to the imagery beneath it. By default, the opacity is 100%, which means that it completely obscures any imagery beneath it. If you have changed the size and color of your label, you might want it to be partially transparent so imagery beneath is visible. To do this, enter a percentage opacity in the *Opacity* field.

Setting Icons for Places and Folders

When you create or edit a placemark or folder, you can change the icon for that item by clicking on the icon button to the right of the *Name* field and choosing a new icon from the palette.

Note - You cannot set the icon for a folder if that folder contains a mixture of placemark data such as a combination of placemarks and overlays. To set icons and their values for folders, you must [enable shared styles](#).

Using Custom Icons

For single placemarks and folders of placemarks, you can select a custom image to use as an icon rather than one of the default set of icons available to all placemarks. When you set a custom icon for a single placemark, the new icon appears for that placemark only. You can also set a custom icon for a folder if style sharing is enabled. In that case, any change to the folder applies to all of the items in the folder.

Note - As with images on web page graphics, custom icons with smaller file sizes work best.

To choose a custom icon:

1. Click the icon in the top right corner of the Edit Placemark/Folder dialog box.

2. Choose *custom* from the icon palette.
3. Indicate a valid path or Web URL in the field beneath the *Icon File/URL* label or click *Browse* to specify the file on your computer or network. If you refer to an image on the web, be sure you have entered the path to the *image itself*, not the web page containing the image.

Setting Line Color and Width

When your placemark data consists of lines, such as with saved directions, you can use the *Line* properties in the *Style* tab to modify the display of the line in the 3D viewer.



- **Color** - To set the color for a line, click on the *Color* swatch and choose a color using the standard color selector. You can choose preset colors or define your own in a variety of ways. Your color choice is added to that of the existing line data in the same way as icon color is modified. In addition, the alpha channel available in the color picker adjusts the opacity of the line in the same way as the *Opacity* setting does.
- **Width** - The default setting for line width is 1 pixel. You can adjust the thickness of the line from 0 to 4 pixels by clicking on the *Width* button and using the up and down arrows to adjust the width within the allowed range. You can enter other values for the line width by typing in a number in the *Width* field. *Note that DirectX users cannot adjust line width.*
- **Opacity** - The opacity setting indicates how transparent the line is relative to the imagery beneath it. By default, the opacity is 100%, which means that it completely obscures any imagery beneath it. If you have changed the width and color of your line, you might want it to be partially transparent so imagery beneath is visible. To do this, enter a percentage opacity in the *Opacity* field or click on the *Opacity* button and use the slider to adjust transparency to your preference.

Setting Altitude

You can change altitude settings in the *Altitude* tab of the *Edit Placemark/Folder* dialog box (*Edit > Properties*). Altitude values can be set on a single item, across all items in a folder using shared styles, or using a mixture of altitude settings for items in a folder. Unlike other shared elements, modifying one item in a folder does not disable the shared style feature for other elements such as color and scale. If your folder contains items with different altitude settings, the parent folder indicates *Mixed Modes* as the altitude settings.

Finally, you can use the values set in the *Altitude* area to extrude geometry.

Altitude Settings

There are three options for altitude:

- **Clamped to ground** - By default, all folders and placemarks are set to this option. Here, because the altitude for the placemark is locked to the ground, no height value is allowed for

altitude. This ensures that the placemark remains fixed to the earth, regardless of whether terrain is on or off.

- **Relative to ground** - When this option is selected, altitude of the placemark is relative to the actual ground elevation of the view. For example, if you set 9 meters as the altitude of a placemark in Venice, Italy, the elevation of the placemark will be 9 meters above the ground because Venice is at sea level. However, if you set the same placemark above Denver, Colorado, the elevation of the placemark will be 1616 meters, because the elevation of Denver is 1607 meters. You can see this how this appears in the 3D viewer by setting elevation, tilting the view, and turning terrain on and off.



Placemark over the Google campus with relative altitude set to nine meters, terrain off



Same placemark, terrain on

You can adjust the altitude using the slider or by entering a value in meters in the *Altitude* field.

- **Absolute** - When this option is selected, altitude of the Placemark is above sea level. In the example above, if you have terrain on and keep altitude to 9 meters but set the altitude type to *Absolute*, the icon would disappear from view because it is actually below the level of the terrain at Denver, Colorado. You can adjust the altitude using the slider or by entering a value in meters in the *Altitude* field.

Drawing Lines With Skirting

Once you set an altitude value for a folder or a placemark, you can check *Draw lines with skirting*. When single-point placemarks are drawn with skirting, a single line appears from the earth's surface to the placemark. When a line or a path is drawn with skirting, a geometric shape is drawn from the earth's surface to the path.

Modifying Folder Settings

Applying description, label, and advanced settings to a folder provides display characteristics that differ from settings applied to individual placemarks or other geometry features. These differences are described here. For more information on how to apply these settings, see the rest of the topics in this section.

- **Folder name and description** - The name and description that you provide when you edit a folder applies only to that folder and not to the items it contains. Use these fields to identify the folder and describe its contents.
- **Folder view** - As with the name and description, the view applies *only to the folder*. Setting a view for a folder is useful when you want to create a viewing angle to encompass all the items contained by the folder. For example, you might have a folder containing placemarks of your

favorite golf clubs in a specific region, each with a separate viewing angle. You can place them all in a folder and set a viewing angle for the folder in order to display all of the placemarks from a consistent viewing angle, if desired. See [Setting the View](#).

- **Shared styles** - You can define a single style for a folder and have the style elements apply to all folder items when you want them to have the same line, label, and icon appearance. This is accomplished first by enabling the "sharing" state for the folder, if it is not already available.

By default, when all items in a folder have either the exact same styles (same line, label, and icon settings) or *no* styles set, sharing is enabled for the parent folder. This means that setting universal styles for all folder items is simply a matter of setting the style for the parent folder.

If the individual items within the folder have different style settings, sharing is turned off for the parent folder.

You can click the *Share Style* button to enable style sharing for all items. Subsequent changes to the settings in this panel **over-write** any style modifications you have made to individual items within the folder.

- **Shared altitude settings** - As with styles, altitude settings can apply to all items in the folder once style sharing is enabled (see above). This includes subfolders. Altitude settings apply to all geometry within the folder. However, if you set different altitude options for individual items within a folder, the altitude option for the folder indicates a setting of "mixed modes."

Modifying Settings for a Single Item

You can modify all settings for a single item to affect the display of that item only. When you change the style and altitude settings for an item in a folder, style sharing is disabled for that folder. However, styles that have been previously applied via the shared styles are preserved for other items in the folder.

Note - The recommended process of using a combination of shared styles with individual placemark modifications is to first apply shared settings to the folder to establish all desired common elements (e. g., icon scale and line color). At that point, you can modify individual items without affecting the general style settings for the other items. However, should you later re-enable shared styles, any individual modifications are overwritten.

[Other topics in this section](#) describe the features you can apply to individual place items.





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Importing Your Data Into Google Earth

You can use the Data Import feature of Google Earth to import your custom geographic data into the Google Earth application and view it over the earth imagery as you would any of the layers in the Layers panel. When you use the import feature of Google Earth, you are importing two basic kinds of data:

- **Vector Data** - Vector data consists of points, lines, paths, and polygons. Typically, point data is used to describe specific locations, such as the center of a city. Lines and paths can be used for road or boundary data, for example, while polygons might be used to describe parcel data or define other areas such as lakes.

You can import vector data into Google Earth from third-party data providers, such as ESRI. In addition, you can use generic text files to import point data that you define yourself.

Once you import vector data into the Google Earth application, you can change its appearance or content in the same way you would when editing placemarks and folders. In addition, you can use *Style Templates* to format your data in visually meaningful ways. You can also display [KML data](#) in a time sequence. To learn more, see [Viewing a Timeline](#).

- **Imagery Data** - You can import imagery data such as aerial maps or topographical maps and have the imagery properly projected over the base imagery in the 3D viewer. For this to work, the imagery file itself must be in the proper format. Imagery of this type is referred to as *GIS imagery*.

Note - The GIS import feature is available only to Google Earth EC users, or as an additional module for Google Earth PRO users. However Google Earth PLUS users can import generic text files.

Once you import vector or imagery data into the Google Earth application, you can save your modified data just as you would other types of placemarks or overlays.

Importing Vector Data

The Google Earth application supports the following kinds of vector data:

- Points
- Lines and paths
- Polygons, including filled polygons

The process of importing vector data files is simple:

1. Import the vector file using one of the following ways:
 - **Drag and drop** - Locate the file on your computer or a network server and drag it over the Google Earth 3D viewer.
 - **Select *Open or Import...* from the *File* menu** - When you choose this option, you can specifically select the type of data you're importing (i.e., TXT, SHP, TAB) or indicate *All data import formats* from the select menu.

You can also open a file from a machine on the network as you would open any file. In addition, if you want to open a file located on a web browser, you must first download the file *and all related files* to your computer or local network and then open it.

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2. At the prompt, choose whether or not to apply a style template. If you select Yes to apply a style template, you can define a new one at that point, or select an existing one if one has already been defined for that data file. For more information, see [Using Style Templates](#).

Once imported, the vector elements appear in the 3D viewer and the imported file is listed under the *Temporary Places* folder. Labels, icons, color, and description appear just as they do for other types of places and folders depending upon how you have defined them using the style template.

Note: If you don't use a style template to modify the appearance of the data you've ingested, Google Earth looks for a *Name* field to use as the label for your data. This label appears in the 3D viewer next to points as well as in the listing beneath *Temporary Places*. If your data does not contain a *Name* field, the first available field that contains text is used as the label for data.

The rest of this section covers the following topics:

- [Using third party vector data](#)
- [Using generic text files](#) that contain tab- or comma-separated point data. Only users of Google Earth EC or Google Earth PRO can import GIS vector data files. However all Google Earth versions can import generic text files
- [Importing imagery](#)
- [A brief discussion of projections and datums](#)

Using Third Party Vector Data

Google Earth EC and Google Earth PRO users with the data import module can import the following vector file formats:

- MapInfo (TAB) - Required files include:
 - MAP ID
 - DAT
- ESRI Shape (SHP) - Required files and information:
 - SHX Projection information, which can either be built into the SHP file or defined in a separate file with a PRJ extension DBF (for viewing field data)
 - US Census Tiger Line Files (RT1)
- MicroStation (DGN) - Google Earth supports only 2D DGN files.

Most third-party GIS vector data comes as a collection of related files that operate together to produce all the vector data you see in Google Earth. Be aware that if expected data does not display in the 3D viewer, it might be due to missing support files. Those vector file types that require additional support files are indicated in the list above.

Note - You can also use generic text files to create your own point data for use in Google Earth. This feature is also available to Google Earth Plus users.

Using Generic Text Files

In addition to importing vector data in SHP, TAB, and other formats, you can define your own point data and import it into Google Earth.

Note - Only point data can be created and imported using generic text files.

Generic text files need named columns whose values are separated either by commas, spaces, or tabs. Do this by creating your data in a spreadsheet application such as Microsoft Excel and then saving the file as either CSV or TXT format. Alternatively, you could use a programmatic method to extract data from a database and produce a final output file in either CSV or TXT format.

Note - If you attempt to import more than 5000 features (i.e., 5000 point data lines) into Google Earth, this process can take a long time.

For more information on using generic text files, see:

- [Required Location Fields](#)
- [Optional and Descriptive Fields](#)

Required Location Fields

At minimum, generic text file that you import must contain one or more fields that specify the *location of the point* on the earth in order for the data to be correctly positioned in the 3D viewer. This can be specified either with address fields or with geographic coordinates.

Note - You cannot use a mix of geographic coordinates and address fields in a single file.

Using Addresses

Your data file can use street-level addressing to position each point on the Earth's surface. The following types of address formatting are supported:

- **Single-address field** - You can define the street, city, state, country, and zip code in a single field. For example, a single field with the column label of *address* might have the following value:

123 Easy Street, San Jose, CA, 95330

- **Multiple address fields** - You can also define street, city, state, country, and zip code in multiple fields. In this case, a field with a column label of *street* would have as its value:

123 Easy Street

In this scenario, additional fields would be defined for city, state, and zip code.

- **Partial address default values** - Because some of your points might have only partial addresses, you can use the data import wizard to define default values for missing fields, such as state or zip Code.

Using Geographic Coordinates

You can use geographic coordinates (latitude, longitude) to indicate the position of the point data in your text file. For importing generic text files, Google Earth supports coordinates described in

- Degrees, minutes, seconds (DMS)
- Decimal degrees (DDD)
- Degrees, minutes, with decimal seconds (DMM)

Refer to [Entering Advanced Coordinates](#) for a detailed description of the latitude/longitude

coordinates supported in Google Earth as well as the type of syntax supported.

Optional and Descriptive Fields

You can use any number of fields in your custom data file to label and describe the points and display them the Google Earth application. Optional fields can be defined as the following values:

- Text or strings - A string field can contain both numbers and alphabetic characters. What actually defines a string with respect to style templates is that the string itself is either enclosed in quotation marks, or contains white space so that it cannot be interpreted as a number.

This is an important distinction to keep in mind when using style templates applied to fields.

- Integer
- Floating point value

With style templates, you can take advantage of these field types to create useful visual effects in the 3D viewer such as graphs or color-coding of data based on the values in the fields.

Viewing Vector Data Fields

After you have imported vector data into Google Earth, you can use the *Table Window* to display the data fields contained within the vector data. To do this, select *Table* from the *Tools* menu. The window appears over the Google Earth application, listing the data fields of all placemark items in tabular form.

The *Table* window displays internal data fields for all vector data currently listed as well as all other entries in the *Places* panel. You can use the scroll bar to the right of the window to scroll through numerous entries, and you can collapse the display of items you don't want to see by removing the check next to the name of the item you want to minimize.

The *Table* window offers the following features:

- **Sort the data by selected columns** by clicking on the column header for the field you want to sort by. With this feature, you can easily view all elements in the data list and view these elements in the 3D viewer.
- **Single-click an item in the table** to highlight that item in the listing under the *Places* tab.
- **Double-click an item in the table** to fly to it in the 3D viewer.
- **Right-click (CTRL click on the Mac) any table row** to access the following pop-up menu, which you can use to sort or modify the field display.

Modifying Vector Data Display

When you import point and line vector data into Google Earth, you can determine how you want your data displayed in one of two ways:

- **Apply a unified display across all data** - Do this either by applying shared styles across a given folder, or by applying a style template to your vector data. For shared styles, follow the guidelines in [Editing Places and Folders](#) for details on setting shared altitude, line, label, and icon properties. Style templates can be applied to your imported data at any point in time.
- **Edit individual data elements or folders** - Follow the guidelines described in [Editing Places and Folders](#) for information on editing individual placemarks.

Importing Imagery

You can open GIS imagery files in Google Earth and have the files correctly projected over the proper map coordinates in the 3D viewer. Google Earth supports the following types of GIS imagery:

- TIFF (.tif), including GeoTiff and compressed TIFF files
- National Imagery Transmission Format (.ntf)
- Erdas Imagine Images (.img)

In addition, you can also import the following images. Because they do not contain projection information, you must manually edit their coordinates for correct positioning:

- Atlantis MFF Raster (.hdr)
- PCIDSK Database File (.pix)
- Portable Pixmap Format (.pnm)
- Device Independent Bitmap (.bmp)

Note - All imagery files must contain the correct projection information in order to be accurately re-projected by the Google Earth software.

The rest of this section covers:

- [Opening GIS Imagery](#)
- [Saving GIS Imagery](#)

Opening GIS Imagery

Use any one of the methods below to open the imagery file in Google Earth:

- Select *Open* from the *File* menu.
- Drag the desired file from an explorer window and drop it over the viewer.

Google Earth then attempts to reproject the image to a Simple Cylindrical, WGS84 coordinate system. From this, it creates an overlay with the image converted to PNG format. The overlay edit window appears, and you can set the location of the new overlay in any folder inside the *Places* panel. You can also set the properties for the GIS imagery as you would any other overlay.

The following should be noted when importing GIS imagery data:

- **The reprojected image is saved as an overlay.** The image is saved under the Google Earth directory on your hard drive. The name of the PNG file is based on the source file name and the scaling or cropping parameters selected when importing the overlay. (See below for more information on scaling or cropping an image.)
- **Images that exceed the maximum texture dimensions must be either cropped or scaled.** A dimension of 2048x2048 pixels is typically supported by high-end graphics cards, while on laptop computers, the maximum dimension can be 1024x1024 or even less. (Very good cards can support up to 4096x4096.)

Determine the maximum allowable texture dimensions for your computer by selecting *About Google Earth* under the *Help* menu. The texture size for your computer will be listed next to the *Max Texture size* label.



Your image cannot exceed the dimension listed in the Max Texture label (in either direction).

If you try to import an image file that exceeds the allowable texture dimensions, a dialog box prompts you to either scale or crop the image.

- **Scale** - This option scales and reprojects the entire image at the same time so that it preserves the aspect ratio of the input image and fits the results in texture memory. The typical size for the resultant image is 2048 pixels along the longest side.
- **Crop** - This option preserves the original resolution of the input image while creating a subset of the original input file in order to fit it in texture memory.

When you select the crop option, the viewer flies to the location of the input image and contains the extents of the input image. You then select the center point of the inset image you want to create. The client computes a maximum area centered from the selected location.

- **For larger image files, reprojection can take some time.**

If you have cropped or scaled an input image, or if you are reprojecting an image that uses more texture memory, you will see a progress meter while the reprojection occurs. You can cancel the operation at any time. **Images that contain no projection information are treated as ordinary overlay files.**

In this case, you can position the image manually as you would an overlay image.

- **Images that contain incorrect or unsupported projection information will not be imported.**

In this case, a dialog box indicates that the reprojection cannot be performed and the image will not be imported.

Note - Currently, files using NAD83 projection are not supported by Google Earth.

Saving GIS Imagery

Once you have imported imagery data into Google Earth, you can save content changes made to the imported GIS data as follows:

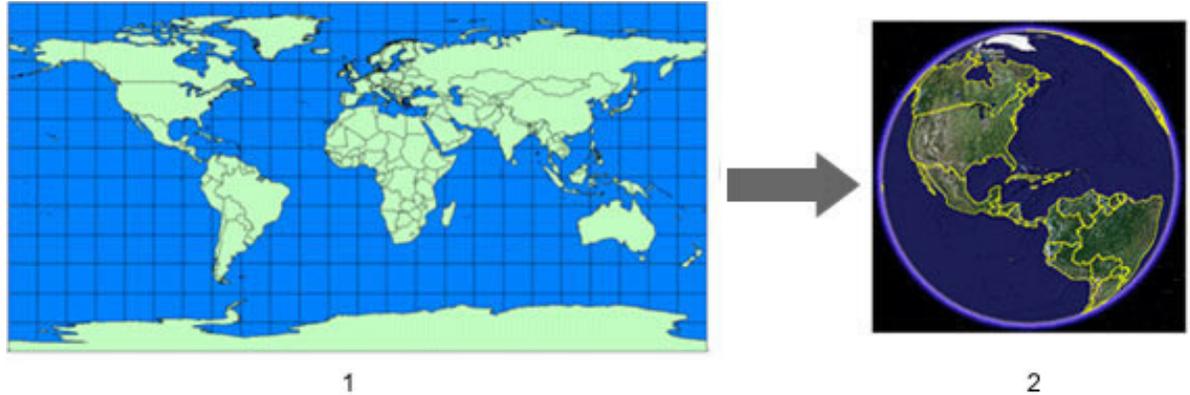
- **Move the imported imagery to remain in your *My Places* folder** - If you have already

placed the imagery overlay within the *My Places* folder, any changes you make to it are automatically saved and viewable each time you start Google Earth.

- **Save the imagery overlay as a KMZ file** - If you wish to remove the imported imagery from your *My Places* folder, you can right-click (CTRL click on the Mac) on the item and select *Save As...* from the pop-up menu and save the GIS overlay as a KMZ file to your computer's hard drive or other accessible file location. After that, you can delete the overlay from your *My Places* list and open it later when you need it.

A Note About Projections and Datums

Google Earth uses Simple Cylindrical projection with a WGS84 datum for its imagery base.



1. Simple Cylindrical (Plate Carree) Projection
2. Google Earth Image Base

Typically, the data you import into the Google Earth application is created with a specific geographic coordinate system, such as a Universal Transverse Mercator (UTM) projection and a NAD27 datum (North American Datum of 1927). Each geographic coordinate system may assign slightly different coordinates to the same location on the earth. When you import data into Google Earth, your data is interpreted according to the Google Earth coordinate system.

In the majority of cases, reprojection works as expected. In some situations, the transformation might not work properly. In that case, you can use a third-party tool to transform your data from its original coordinate system into the one used by Google Earth.

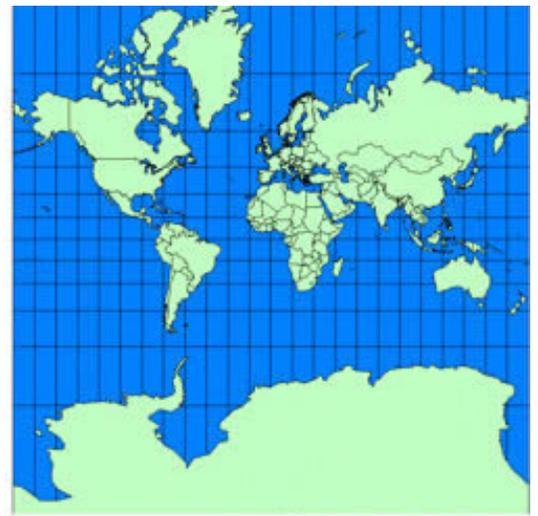
The rest of this section provides a brief overview of map projections and datums.

What is a Map Projection?

A map projection is a mathematical expression that is used to represent the round, 3D surface of the earth on a flat, 2D map.



1



2

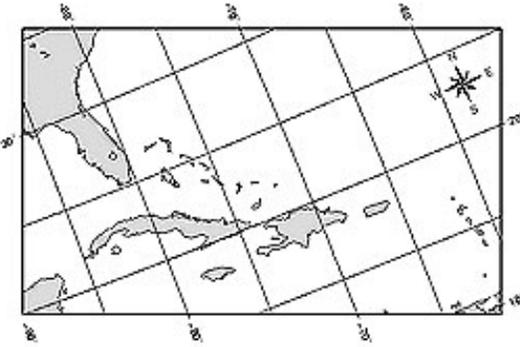
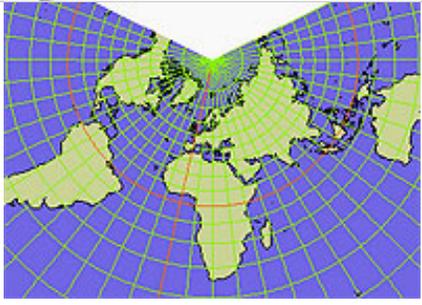
1. 3D Earth
2. Mercator Projection

This process *always results in distortion* to one or more map properties, such as area, scale, shape, or direction. Because of this, hundreds of projections have been developed in order to accurately represent a *particular* map element or to best suit a particular type of map.

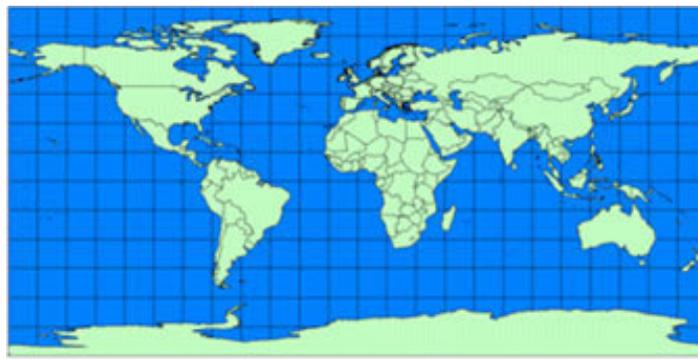
Data sources for maps come in various projections depending upon which characteristic the cartographer chooses to represent more accurately (at the expense of other characteristics). In the example above, the Mercator projection preserves the right angles of the latitude and longitudinal lines at the expense of area, which is distorted at the poles, showing the land masses there to be larger than they actually are.

The following are some common map projections:

Projection	Description	Example
Albers Equal Area Conic	Typically used for small regions or countries extending in an east-to-west direction, but not continents. Preserves angles between meridians and parallels. Attempts to minimize distortion for both shape and linear scale, but neither is truly correct. The example here shows how this projection looks over the entire earth.	

<p>Oblique Mercator (Hotine)</p>	<p>A cylindrical projection like the Mercator projections, but where the cylinder is shifted to align with a region that is oblique and follows neither a north-south nor an east-west axis. The region to be mapped typically is a small portion along the length of the meridian and close to it laterally. For example, this projection was developed originally for mapping the Malaysian peninsula.</p>	
<p>Chamberlin Trimetric</p>	<p>Used by the National Geographic Society for mapping most continents. This projection is a three-point equidistant one, intended to preserve the distance between three reference points relative to any other point.</p>	
<p>Lambert Conformal Conic</p>	<p>A projection ideal for middle latitudes and/or where the territory to be mapped has an east-west orientation. This projection is often found in USGS maps created after 1957. Scale is most accurate at the expense of area.</p>	

When building whole-earth databases, a single global projection is the most convenient to use. Google Earth uses Simple Cylindrical projection for its imagery base. This is a simple map projection where the meridians and parallels are equidistant, straight lines, with the two sets crossing at right angles. This projection is also known as Lat/Lon WGS84.



1



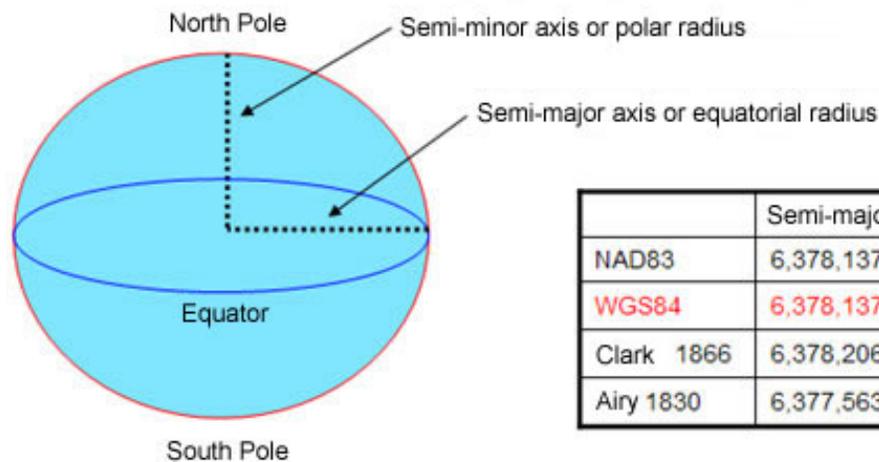
2

1. Simple Cylindrical (Plate Carree) Projection
2. Google Earth Image Base

What Is a Datum?

While a projection is used in mapping to define the earth on a flat surface, a datum is used to describe the actual shape of the earth in mathematical terms. This is because the earth's surface is not perfectly round, but ellipsoid in shape. A datum also defines the association of latitude and longitude coordinates to points on the surface of the earth, and defines the basis for elevation measurements.

As with projections, there is more than one mathematical interpretation of the earth's shape. Google Earth uses WGS84 datum.



	Semi-major axis	Semi-minor axis
NAD83	6,378,137.0	6,356,752.3141
WGS84	6,378,137.0	6,356,752.3142
Clark 1866	6,378,206.4	6,356,583.8
Airy 1830	6,377,563.4	6,356,256.9





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Using Style Templates

Note - This feature set is available to users of the Google Earth Pro product. Visit <http://earth.google.com/products.html> for more information.

Often the data you import into Google Earth contains multiple features that are not automatically converted into a readily visible feature in the 3D viewer. For example, a shape file defining the population boundaries for a specific region might have a field that supplies the population number for each boundary defined in the data. Or, a CSV file might contain real estate listings with a field showing the square footage of each listing.

You can use style templates when importing this data in order to display fields in your data in meaningful ways.

This is accomplished by *mapping* or connecting specific fields in your imported data to one of four template display features:

- **Name** - By default, if a field for your data contains the phrase *name* as its label, Google Earth maps that field to the name displayed in the viewer for your point. However, you can map any field in your imported data to the **Name** element.
- **Color** - The color field applies color to your data. Icons are colored if you import point data, and shapes or lines are colored if you imported that type of data. For more information, see [Mapping Color Styles](#).
- **Icons** - You can use the icon display feature to select an icon from the list for your imported point data. You can select a single icon for all point data, apply icons randomly, or select specific icons for specific fields. See [Mapping Icons to Point Data](#).
- **Height** - The height feature generates a height for the selected column in your data. If the selected data is numeric, height values can be spread across a range of values. If the data is text, icons can be supplied to individual fields. See [Mapping Height Values](#).

The rest of this section covers:

- [Applying a Style Template](#)
- [Customizing the Value Ranges for Numeric Data](#)
- [A Style Template Example](#)

Applying a Style Template

This section covers the basic steps for applying a style template to vector data that contains fields you want to have displayed in the 3D viewer. You can apply style templates to newly ingested data or to existing KML data. In addition, you can modify existing templates using the steps below.

Note - Bear in mind that style templates are quite specific to the data you are working with. While you can use the same style template for different data that has the same fields, the template settings will often have to be adjusted to represent the data properly. As your original data set changes with new data, you might also need to adjust the template to accommodate new information.

1. **Choose the data that will have the style template applied to it.** If you are importing the data for the first time, simply click the **Yes** button when prompted to apply a style template.
2. If you already have this data in your *Places* panel, right-click (CTRL click on the Mac) on the parent folder of the data and select *Apply Style Template...* from the pop-up menu. (Use this method when you want to edit a recently-created style template.)
3. In the *Style Template Settings* dialog box, indicate whether you are creating a new template or using an existing one.

[Color](#)

- [Using Random Colors](#)
- [Setting Colors Based on Field Values](#)
- [Mapping Icons to Point Data](#)
- [Setting Icons Based on Fields](#)
- [Mapping Height Values](#)
- [Height Values for Text Fields](#)
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- [Using Style Settings to Modify Point Display](#)
- [Using Buckets for Field Data](#)
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4. If you have an existing style template for your data, it appears in the *Compatible templates* list along with any other style template that is compatible to the data you have selected. If you choose to use an existing style template, select the correct one from the list. If you simply want to apply the template to your data without changing the template itself, leave the *edit selected template* check box clear. To edit the style template, select the check box.
5. When you create new template or edit an existing one, the *Style Template Settings* dialog box appears.
6. Choose a field from your data that you want to use as a Name, or label, for your data. This name appears in the 3D viewer as well as in the Places panel that lists the data points.
8. Click on the Color tab and map an element of your data to color styles. See [Mapping Color Styles](#) for details.
9. Click the Icon tab and map an element of your data to one or more icons. See [Mapping Icons to Point Data](#) for details.
10. Click the Height tab to map a height value to a data element. See [Mapping Height Values](#) for details.
11. Click OK when you are finished defining your styles. The values defined appear in the 3D viewer.

The rest of this section discusses in detail how to apply template values to data. Finally, you can use the instructions in [A Style Template Example](#) to walk through the process of defining a style template on sample point data from a text file.

Mapping Color Styles

You can apply color to selected fields in your imported data. In this case, color is applied to the feature depending upon the type of data imported:

- **Icons** are colored with point data
- **Lines** are colored when applying to lines or paths
- **Solid polygons** are colored with shape data

Use the color style to color these elements in a meaningful way depending upon both the data type and the field data within the entire set. You can use three mechanisms to color data:

- Use a single color for all features
- Use random colors
- Set colors based on field values

The rest of this section describes how to use these color application methods.

Using a Single Color

If you want to use one color for all the points or lines from your imported data, select the *Use single color* option and click on the colored square next to the option. From the color selector, choose a color or define your own color to apply to the data.

Using Random Colors

To use a variety of colors that are applied randomly by Google Earth, select the *Use random colors* option.

Note - The line or point data will be colored based on values supplied by Google Earth. If you are also supplying an icon for point data, the color is added to the existing color of the icon.

Setting Colors Based on Field Values

While applying colors to data features helps distinguish features from each other in the 3D viewer, using colors based on field values provides a way to display data about the feature set that you couldn't otherwise easily display. For example, you might want to set a short range of colors based on the square footage of real estate listings. Or, you might want to set a range of colors for shape files showing average household income.

Use the following steps to define color values by a data field.

1. Select the Set color from field option in the Color tab.
2. Choose the field that you want to apply color data to from the Set color field drop-down list. Here, you can choose either numeric fields or text fields from your data. See [Choosing Field Types for Style Mapping](#).
3. Choose the starting and ending color (optional) for your color mapping. By default, the style template "color buckets" are created from blue and mapped through the spectrum to red. If you want to change the color range, you can click on each color block and set the starting and ending colors as desired. Google Earth automatically calculates the color range between the two chosen values.
4. Use the Number of buckets selector to indicate how to group the range of field values. This option is only available for fields with numeric data. The ranges for each bucket are automatically computed, but can be adjusted manually. See [Customizing the Value Range for Numeric Data](#) for details. To learn how buckets behave for string and numeric fields, see [Using Buckets for Field Data](#).
5. Make any further desired adjustments.
 - o **Subfolders** - You can create subfolders for each color bucket so that the *Places* listing displays the data elements grouped by color into their respective folders. This makes it easier for you to show or hide the display of color groups simply by selecting or removing the check box next to the folder. Once you select the sub-folder option, you must provide a name for your sub-folder in order for the data to be properly grouped in the *Places* listing. Note that you can only define a single sub-folder option for either color or icon display.

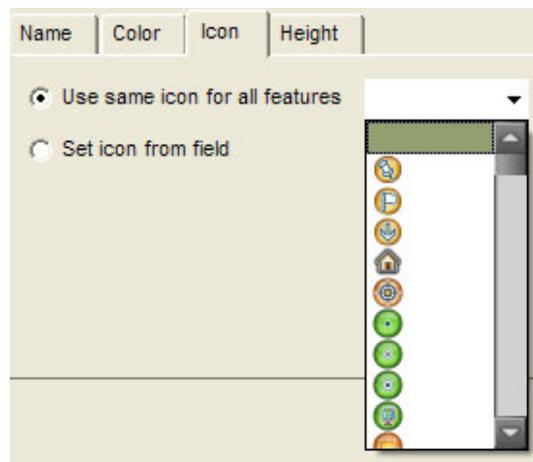
Color	Minimum value	Maximum value	Folder name	Count
Blue	2000	3500	2000-3500	3
Green		4000	3500-4000	2
Red		6234	4000+	3

- o **Color display order** - You can click the *Reverse order* button to reverse the display order of the color range. So, if you have a range of colors starting with blue for the first element and ending with red for the last one, reversing the order will apply red to the first element and blue to the last.
 - o **Color adjustments to single buckets** - You can modify each color element individually by clicking on it and adjusting the color for that particular value or value range. In addition, you can modify the settings for numeric buckets to adjust the spread of the data to your preference. See [Customizing the Value Range for Numeric Data](#) to learn how to adjust the numeric ranges once you choose the number of buckets for a range of numbers.
6. **Click the OK button to apply and view your changes.** - Save the style template. You can always edit the template to apply icon and height styles or to make additional color adjustments. Do this by following the instructions in [Applying a Style Template](#).

Mapping Icons to Point Data

As with color, you can apply icons to fields in your data. However, icons can only be mapped to point data, so if you are importing line or shape data, the Icon style tab will be unavailable. You can use two mechanisms for mapping icons to points:

- **Use the same icon for all features** - To do this, simply select the Use same icon for all features option and choose an icon from the drop-down list.

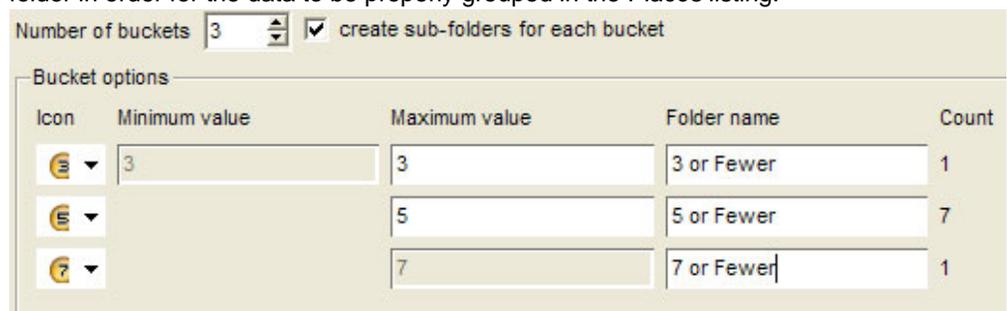


- **Set icon from a field** - The actions for doing this are similar to those described in [Mapping Color Styles](#), and are described in the sections that follow.

Setting Icons Based on Fields

These steps describe the basic process of mapping icons to fields in your data. The following steps describe the basic process for defining color values by a data field.

1. Select the *Set icon from field* option in the Icon tab.
2. Choose the field that you want to apply icon labels to from the *Set icon from field* drop-down list. Here, you can choose either numeric fields or text fields from your data. See [Choosing Field Types for Style Mapping](#).
3. Use the *Number of buckets* selector to indicate how to group the range of field values. This option is only available for fields with numeric data. The ranges for each bucket are automatically computed but can be adjusted manually. See [Customizing the Value Range for Numeric Data](#) for details. To learn how buckets behave for string and numeric fields, see [Using Buckets for Field Data](#).
4. For each bucket defined, select an icon from the list.
5. Make any further desired adjustments:
 - **Subfolders** - You can create subfolders for each icon bucket so that the *Places* listing displays the data elements grouped by the folder label into their respective folders. This makes it easier for you to show or hide the display of icon groups simply by selecting or removing the check box next to the folder. Once you select the subfolder option, you must provide a name for your subfolder in order for the data to be properly grouped in the *Places* listing.



Note: You can only define a single subfolder option for either color or icon display.

- **Icon adjustments to single buckets** - You can modify each icon element individually by clicking on it and adjusting the icon for that particular value or value range.
 - In addition, you can modify the settings for numeric buckets to adjust the spread of the data to your preference. See [Customizing the Value Range for Numeric Data](#) to learn how to adjust the numeric ranges once you choose the number of buckets for a range of numbers.
6. Click *OK* to apply and view your changes.
 7. Save the style template. You can always edit the template to apply icon and height styles or to make

additional color adjustments. Do this by following the instructions in [Applying a Style Template](#).

Mapping Height Values

By default, no height values are defined initially in the *Height* tab. Use the *Height* tab in the *Style Template Settings* dialog box to set height values from a selected field. Once height values are activated, points, lines, or shapes are extruded from ground level to the height defined for each data element. If you map height to lines or shapes, the values you define work in combination with the colors defined in the *Color* tab.

On the other hand, if you map height to point data, those points are extruded using a single pixel colored line to connect the icon from its elevated position to the ground. You can use style settings to modify the width and color of those lines if you wish.

The rest of this section covers details for using height values effectively, including:

- [Height Values for Text Fields](#)
- [Height Values for Numeric Fields](#)
- [Using Style Settings to Modify Point Display](#)

Height Values for Text Fields

The height map settings for text fields differ from those for numeric fields. If the field you choose to map contains text data, the first 8 unique fields are each defined in their own container, or bucket. For this reason, it makes sense to only map height values to a field that has 8 or fewer unique values. See [Choosing Field Types for Style Mapping](#) for more details.

When you map height values to a text field, the following settings are available:

- **Individual height values** - The height mapping wizard automatically calculates reasonable height values for your data given its geographical extents. For example, for points clustered around a small region, 20 - 2000 meters might be adequate to view all points as elevated when looking at the entire set in the 3D viewer. On the other hand, if your data set encompasses an entire state, higher values are calculated so that height is apparent when looking over the entire region in the 3D viewer.

You can always modify the height values by hand to adjust each point to your preference. In general, the greater the distinction between each point, the easier it is to visualize that distinction in the 3D viewer from a distance. **Height units** - By default, height units are set to meters, but you can change them to feet if you prefer. When you change the default value from meters to feet, you might want to adjust the values in each bucket upward to make the data visible in the 3D viewer.

- **Scaling factor** - Use the *Scaling factor* slider to uniformly adjust the numeric values in all height fields. The slider provides a general factor from .1 times the value to 10 times the value defined in each field. If you manually adjust the height values, you can also use the *Scaling factor* slider to make further adjustments to those numbers.

Height Values for Numeric Fields

When you map height values to a numeric field in your data, you can choose from two types of mapping methods: [continuous](#) or [split into buckets](#).

Using Continuous Mapping

The continuous mapping method uses the minimum and maximum values of your selected field to determine a minimum and maximum height display for the entire set. It then maps all data within the set in a way that best corresponds to each individual field. In the example, the *Square_footage* field is used to map height values, with the minimum value of 2000 and a maximum value of 6234. Each of the 9 elements in the set is displayed at a slightly different height value that most accurately displays its relationship to the other points. This particular method is useful in smaller data sets where individual distinctions between points or shapes are easily visualized.

With the continuous mapping method, you can use the *Scaling factor* slider and the *Height units* selector as

described above in [Height Values for Text Fields](#). Additionally, you can enter the desired height you want for the beginning and ending ranges of your data. For example, you might want houses starting at 2000 feet to be displayed in the 3D viewer at a height of 100 meters, and houses at the ending range to be displayed at a height of 5000 meters.

In the 3D viewer, the visual distinction between individual elements using this method is affected by both the height range you set and by the number of elements in the data. For example, a range of 100 - 5000 meters for a set containing only 9 elements creates a visually distinct height for each point.

If you decrease the range or increase the number of elements in the set, the distinction between each element diminishes.

Splitting Values into Buckets

Use the *Split into buckets* mapping method to create up to 8 height groupings for your data. This method works well for large data sets where continuously mapped heights are not easily visualized in the 3D viewer. For example, if your data set contains over 1000 housing listings clustered around a small region, it might be difficult to see the actual difference between houses in different height categories. By using the *Split into buckets* option, you can create more meaningful categories and define visually distinct gaps in their display. For example, you might have all listings between 2000 - 3000 square feet display at a height of 500 meters, all listings between 3000 - 4000 square feet display at a height of 1500 meters, and so on. While this method will not distinguish a house at 3000 square feet from one at 3200 square feet, it will allow a more immediate visual grasp of the categories you have defined.

As with color and icon styles, the maximum value for each bucket is automatically computed, but can be adjusted manually. Use the *Scaling factor* slider and the *Height units* selector for this method as described above in [Height Values for Text Fields](#). As you set the number of buckets and define the maximum value for each bucket, the Style Template wizard displays the count of items for each bucket. For more details, see [Using Buckets for Field Data](#).

Using Style Settings to Modify Point Display

The color values you set for point data are applied to the icon that you map to points as well as to the line that is extruded from the point on the earth for the height of the line, as shown in the real estate listing example above. However, in some cases it might not be easy to visualize a single-pixel line in the 3D viewer against the earth imagery.

In that case, you can edit the style settings for each point in order to modify the line thickness.

1. Right-click (CTRL click on the Mac) on the point you want to modify and select *Properties* from the pop-up menu.
2. In the Edit Placemark dialog box, in the *Style, Color* tab, modify the point's appearance as appropriate.
3. Click *OK*.

Since this process is not practical for large data sets, you might consider applying changes to entire folders or subfolders. Beware that if you do this, any individually defined styles will be lost. In this case, use the subfolder feature of the *Style Template* wizard to group similarly styled data into subfolders. Make sure that each folder created has similar color and icon data. Then, apply the height value to your data and save the style template. Later, use the steps above to create shared styles for each subfolder you set up. As long as all of the data within each folder has the same color value and the same icon value, changes to the line thickness will not impact those settings.

Using Buckets for Field Data

When using color, icon, or height mapping for specific fields in your data set, you typically define a number of buckets, or containers, to distinguish different ranges of data. The sections that follow describe how different field types are interpreted by style templates, as well as how you can adjust the range of values when mapping numeric data.

Choosing Field Types for Style Mapping

You can choose two basic types of fields from your data when mapping color, icon, or height values:

- **Text (string) fields** - If the field that you map to color or other style contains non-numeric data (i.e., text and other characters), the application looks for the *first 8 unique* text fields, and maps those fields to the style. If there are fewer than 8 values in your data, each unique value is paired to a different color, icon, or height. If there are more than 8 values, the first 8 unique values are mapped to a style, and the rest of the values are grouped together and mapped to a ninth style. For this reason, it typically is most useful to apply a style to text fields that contain *small unique sets*.

For example, in the real estate example described in [A Style Template Example](#), there is a field in the data called *School_district*. This field defines the school district ratings for each listed house. Because there are only three districts: AA, AAA, and AAAA, it makes sense to use a style to distinguish this type of text field. You might, for instance, decide to map a height to this field, so that users viewing your data see the highest points as those belonging to houses in the highest-rated districts, and so on.

- **Numeric field** - If the field that you choose contains numeric data, the application automatically apportions the numeric data across the number of buckets that you select, and provides a count of items in each bucket. If you increase or decrease the number of buckets, the application automatically re-apportions the number of elements for each bucket.

Note: If you are using a spreadsheet application such as Microsoft Excel to create your data, be sure that the cell format you choose for numeric fields has been set to *numeric* and not text. If you have numeric fields in your CSV saved from a spreadsheet, but the *Style Template* wizard is not recognizing it as numeric, it might be due to incorrect formatting. To verify whether the actual field is marked as text or numeric, open the CSV file in a simple text editor and look at the field in question. If it is enclosed in double quotation marks, then it has been defined as text — even if there are only numbers within the quotations. You can remove the quotation marks manually from the file, or open your spreadsheet application and format the cells as numeric and save the CSV data again.

Customizing the Value Ranges for Numeric Data

Typically, you will want to customize the numeric values to define buckets in ranges that are more meaningful for your data. For example, you might modify the ranges displayed in the example above to round figures typically used to describe square footage for houses. To do this, simply enter the values you want as the maximum value for each bucket. As you do this, the number of elements contained by the new definition updates to reflect your changes.

Keep in mind the following about how to adjust numeric field values:

- **You cannot adjust the minimum value for the set, nor the maximum value.** This means that the range for the last bucket is actually defined by the maximum value of the previous bucket. In the example above, then, if you want to change the last bucket to contain 4 items, you would decrease the maximum value of the green bucket until the *Count* field showed 4. **You must adjust the values for each bucket so as not to collide with the values defined for other buckets.** When organizing your data into buckets, it's easiest to sketch your bucket values down first before attempting to adjust them in the *Bucket options* fields, or to start at one end of the data set and work toward the other. You cannot enter a value in one bucket that is either greater than the maximum value of the next bucket, or less than the maximum value of the previous bucket.

For example, in the first color bucket example above, suppose you know that you want your first bucket to show all houses with a square footage of 5000 or less, and you want the second bucket to show a narrow range of houses from 5000 to 5500 square feet. If you enter the number 5000 next to the first bucket, you will receive an alert asking you to pick a number between 2000 and 4822.67. Because the maximum value of the next higher bucket is 4822.67, you cannot enter a value in the previous bucket that exceeds it. Thus, to accomplish your goal, you would first need to adjust the second bucket's maximum value to 5500. At that point, you could adjust the value of the first bucket to 5000.

- **Field data whose numbers exceed a certain number of digits might display in scientific notation.** Depending upon the size of the input box on your screen, some larger numbers (such as those exceeding 6 digits) will display in scientific notation. For example, you might see the number 1,628,000 displayed as $1.628e+06$. If you move the decimal point over 6 places, you will obtain the number in regular notation.

A Style Template Example

This tutorial is designed to help familiarize you with the basic process of defining, editing, and using a style template for any data you import into Google Earth. This example uses a text file saved in CSV (Comma Separated Value) format showing some fictional real estate listings in the greater Detroit area. This tutorial covers the following:

- [Saving the Sample File](#)
- [Importing the File](#)
- [Creating Style Template Name and Color Settings](#)
- [Modifying the Style Template for Icon Settings](#)
- [Removing Duplicate Folders](#)
- [Adding Height Values](#)
- [Creating a Map Legend](#)

Saving the Sample File

1. Use this provided [sample real estate listing](#) to follow along with this tutorial. Click on the link and save the file to your computer. If you are using Firefox, right-click (CTRL click on the Mac) on the link and select Save Link As... from the pop-up menu. You can also open and view it with a spreadsheet application if you wish. Navigate to a location on your computer's hard drive (such as My Documents or Documents) and save the file.
2. To avoid the confusion in the rest of this tutorial, keep the sample file named MetroDetroitRE.csv.

Use this file in the rest of this tutorial as your GIS data source. If you are curious what a comma-separated text file looks like, open the file using a simple text editor. If you do this, close it without saving any changes.

Importing the File

1. Click *File > Import*. Navigate to the place on your computer's hard drive where you saved the file in the steps above. Select the MetroDetroitRE.csv file and click Open. Click Yes when asked if you want to apply a style template.
2. In the Style Template Options dialog box, verify that Create new template is selected and click OK.

You are now ready to create and view the style template.

Creating Style Template Name and Color Settings

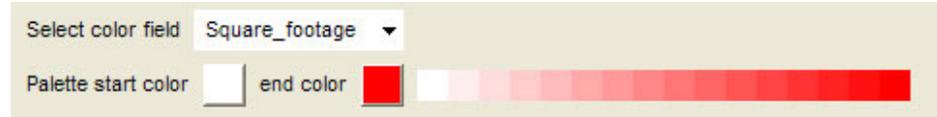
In this section, you will supply a name label to the real estate listings and color code the listings based on the *Square_footage* field. After that, you will save the template and view your settings.

1. With the Style Template Options dialog box open, be sure the Name tab is active.
2. Click the black arrow next to the Set name field selector.
3. Choose the first field in the list, Address.

Notice how the preview table shows the Address column as selected. You can also click on the column heading of any column in the preview table to change your choice. When you are finished, be sure the Address column is the selected element for the Name field.

4. Click the Color tab. Notice how the default setting here is to use a single color for the point data, and that the color is set to white.
5. Select the Set color from field option.
6. From the Select color field selector, choose *Square_footage* as the field. Again, you can see how the *Square_footage* column is selected as the chosen field in the data preview table.

7. Adjust the color range to your preference. For instance, suppose you want graduations of a single color red from light to dark. Click the color square next to Palette start color and choose white in the color picker dialog box. Since the default ending color is already red, you can leave that square as it is. The color range gradient will update to reflect your new choice.



8. This tutorial will use the default color palette range of blue to red. To change it back, simply click on the white color box and choose a blue color from the color picker.
9. In the Number of buckets selector, set the number to 3 if it is not already.
10. Select the create sub-folders for each bucket check box.
11. In the Bucket options area, set the Maximum value fields from lowest to highest as follows:
 - o 3000
 - o 4000
12. Provide meaningful folder names for each bucket. For example:
 - o 2000 - 3000 Square Feet
 - o 3000 - 4000 Square Feet
 - o 4000 - 6500 Square Feet
13. Click *OK* at the bottom of the Style Template Settings window.
14. In the Save Template dialog box, click the Save button. Note that the name of the template file corresponds to the name of your imported file.
15. Leave this name as it is, and click the Save button. The 3D viewer adjusts to encompass all the points in the data file. Notice that the number of blue icons corresponds to the count next to the blue bucket and so on for all three buckets (3 blue, 2 green, 3 red).
16. In the Temporary Places folder within the Places panel, expand both parent folders until you see the three subfolders you created in the steps above.

You can turn off the display of all houses contained within a given folder simply by removing the check mark next to that folder.

You can also adjust the ordering of the folders by dragging the *3000 - 4000 Square Feet* folder to the space between the two remaining folders, so that the order appears in sequence.

Take some time to explore the data related to each point. You can double-click on an item within a folder to zoom into that view as well as to view the info balloon for the point. Or, click on the point in the 3D viewer to view the info balloon.

Modifying the Style Template for Icon Settings

In this section, you modify the style template you've saved to apply icons that display the number of bedrooms for each listing.

1. Right-click (CTRL click on the Mac) on the top-most folder called MetroDetroitRE.csv and select Apply Style Template... from the pop-up menu.
2. In the Style Template Options dialog box, select *Use existing template*.
3. Select the MetroDetroitRE template from the list if it is not already, and check edit selected template.
4. Click the OK button and in the Style Template Settings dialog box, click the Icon tab.
5. Choose the Set icon from field option and in the Select icon field selector, choose Bedroom from the list, or click on the Bedroom column in the preview table.
6. Set the Number of buckets selector to 4. Notice the count display that shows how many listings have the corresponding number of bedrooms per value.

7. From the Icon selector next to each bucket, choose the number icon that corresponds to the maximum value for each field.
8. Click the OK button on the Style Template Settings dialog box.
9. In the Save Template dialog box, click Save, and when prompted to overwrite the existing template, click Yes. In the 3D viewer, you should see the icons change to reflect your settings.

Removing Duplicate Folders

Each time you modify a style template, any folders you have created using folder options are duplicated.

Because you might have hand-modified data within the parent folder (including manually created sub-folders), the style template wizard avoids overwriting your data and simply creates another set of folders, removing the visibility check from the older ones. You can choose to retain this historical data (which will increase each time you modify and save a template), or you can right-click (CTRL click on the Mac) on the folders you no longer want and select *Delete* from the pop-up menu.

Adding Height Values

In this section of the tutorial, you will modify the style template to create height values based on the price of the house.

1. Right-click (CTRL click on the Mac) on the top-most MetroDetroitRE.csv folder and select Apply Style Template... from the pop-up menu.
2. Choose the Use existing template option, select the template, and check the edit selected template check box.
3. Click the Height tab in the Style Template Settings dialog box and choose the Set height from field option.
4. Click the Price column in the table preview to choose the price field for height.
5. Select Continuous as the mapping method.
6. Leave the Scaling factor slider to 1.0 and the Height units to meters.
7. Next to the minimum value row, replace 20.4005 with 100 as the value.
8. Next to the maximum value row, replace 2040.05 with 5000 as the value.
9. Click the OK button on the Style Template Settings dialog box and save the template, replacing the previous version.
10. If desired, remove the duplicate folders from the parent folder.
11. Tilt the view in the 3D viewer to see the effects of your settings.

Creating a Map Legend

In this final section of the tutorial, you can view the code behind a [sample KMZ file](#) designed to create a legend for the 3D viewer so that users can readily view the meaning of the settings you've defined in the style template. If you click on the link for this KMZ file, you can open it in your Google Earth browser to view the legend for the data you've created here. You can also save the file to your computer and open it using a text editor to see the code that is described in this section.

The diagram that follows shows the code used to create the KMZ file. Using the KMZ file you opened as a model, you can create your own screen overlay for your own data as follows (these tips assume you understand how to use basic web-oriented tools such as FTP, image editors, and HTML editors):

- Replace the referenced graphic with a graphic that you create using a graphics tool application such as Adobe Photoshop or Microsoft Paint.
- Save the graphic you create in a compatible format such as PNG, GIF, or JPEG.
- If you want the graphic to be viewable on the web or a network, be sure to place the graphic in a location others can access it, and use the correct URL to reference it (i.e., `\\networkpath\folder\folder\imageFile.png` for network files or `http://www.test.com/images/myScreenOverlay.png` for web-based files).

- Name the file with a meaningful name and an extension of .kmz.

```
<?xml version="1.0" encoding="UTF-8"?>
<kml xmlns="http://earth.google.com/kml/2.0">
<ScreenOverlay id="khscreenoverlay756">
<description>This screen overlay uses fractional positioning
to put the image in the exact center of the
screen</description>
<name>Real Estate Legend</name> ← 1
<visibility>0</visibility>
<Icon>
<href>C:\Documents and Settings\HP\My
Documents\Google\GoogleEarth\reLegend.gif</href> ← 2
</Icon>
<overlayXY x="1" y="1" xunits="fraction" yunits="fraction"/>
<screenXY x="1" y="1" xunits="fraction" yunits="fraction"/>
<rotationXY x="0.5" y="0.5" xunits="fraction"
yunits="fraction"/>
<size x="0" y="0" xunits="pixels" yunits="pixels"/>
</ScreenOverlay>
</kml>
```

1. Enter the name of your screen legend between the <name></name> tags. This name appears in the Places panel. You can drag this into the parent folder of your style template.
2. Enter the correct URL of the image that you use to create the legend. Here, the sample path is the format you use to reference an image on your local computer. For images on a web server, use the URL to the image itself (not the web page containing the image, and be sure the image has been uploaded to the location referenced by the URL).





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Keyboard Controls

This section covers the various keyboard combinations that you can use to control navigation, window focus, and application behavior in Google Earth.

- [Application Level Control](#)
- [3D Viewer Navigation](#)
- [Tour Mode Controls](#)
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Application Level Control

The following keystrokes control the Google Earth application.

Command	Windows/ Linux Keystroke (s)	Mac Keystroke (s)	Result
File Menu	Alt + F (English/ Japanese) Alt + F (French) Alt + F (Italian) Alt + D (German) Alt + A (Spanish)	(none)	Opens the <i>File</i> menu. You can use the down and up arrows to select items once the menu is open.

[Areas](#)

[Drawing Paths and Polygons](#)

[Using Image Overlays and 3D Models](#)

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Edit Menu	Alt + E (English/ Japanese) Alt + M (French) Alt + M (Italian) Alt + B (German) Alt + E (Spanish)	(none)	Opens the <i>Edit</i> menu. You can use the down and up arrows to select items once the menu is open.
View Menu	Alt + V (English/ Japanese) Alt + C (French) Alt + V (Italian) Alt + A (German) Alt + V (Spanish)	(none)	Opens the <i>View</i> menu. You can use the down and up arrows to select items once the menu is open.
Add Menu	Alt + A (English/ Japanese) Alt + J (French) Alt + A (Italian) Alt + Z (German) Alt + D (Spanish)	(none)	Opens the <i>Add</i> menu. Use the down and up arrows to select items once this menu is open.
Tool Menu	Alt + T (English/ Japanese) Alt + O (French) Alt + F (Italian) Alt + T (German) Alt + H (Spanish)	(none)	Opens the <i>Tool</i> menu. Use the down and up arrows to select items once this menu is open.

Help Menu	Alt + H (English/ Japanese) Alt + A (French) Alt + G (Italian) Alt + H (German) Alt + Y (Spanish)	(none)	Opens the <i>Help</i> menu. You can use the down and up arrows to select items once the menu is open.
Open File	Ctrl + O	⌘ + O	Produces the file open dialog box, allowing you to open all supported Google Earth file types.
Save Image	Ctrl + Alt + S	⌘ + Alt + S	Saves the current view as an image to your computer.
Print	Ctrl + P	⌘ + P	Produces the print dialog box, allowing you to print the current view.
Email View	Ctrl + Alt + E	⌘ + Alt + E	E-mails the current view either as a placemark or image file.
Copy	Ctrl + C	⌘ + C	Copies the current selection in the <i>Places</i> listing.
Cut	Ctrl + X	⌘ + X	Cuts a placemark or other item from the listing in the <i>Places</i> panel. Cuts an icon from the 3D viewer. Both icon or listing item must first be selected. You can use this feature to organize your places data.
Paste	Ctrl + V	⌘ + V	Pastes a placemark or other item into the selected folder in the <i>Places</i> panel. You can use this feature to organize your places data.
Find	Ctrl + F	⌘ + F	Opens a Find field in the <i>Places</i> panel. Use this to find places that exist in the <i>Places</i> panel. Note that this is different than search for places on the earth .
Delete	Del	Delete	Deletes an item selected in the <i>Places</i> panel.

Rename	Ctrl + Alt + R	⌘ + Alt + R	Enters edit mode for a selected item in the <i>Places</i> panel, so you can change the name without bringing up the <i>Edit Placemark</i> dialog box.
Zoom to selected placemark/item	Enter	Enter	Zooms into a selected folder, placemark, or other item in the <i>Places</i> panel.
Full screen mode	F11	(not supported)	Toggles between full screen and window view for the Google Earth application.
Show/Hide sidebar	Ctrl + Alt + B	(not supported)	Displays or closes sidebar
Lat/Lon grid	Ctrl + L	⌘ + L	Produces a latitude and longitude grid over the surface of the earth in the 3D viewer.
Play Tour	Ctrl + Alt + P	⌘ + Alt + P	Plays the tour mode for all selected items in the <i>Places</i> panel.
New placemark	Ctrl + Shift + P	⌘ + Shift + P	Adds a new placemark to the current view.
New folder	Ctrl + Shift + N	⌘ + Shift + N	Produces the New Folder dialog box.
New image overlay	Ctrl + Shift + O	⌘ + Shift + O	Produces the New Image Overlay dialog box.
New model	Ctrl + Shift + M	⌘ + Shift + M	Produces the New Model dialog box
New path	Ctrl + Shift + T	⌘ + Shift + T	Produces the New Path dialog box.
New polygon	Ctrl + Shift + G	⌘ + Shift + G	Produces the New Polygon dialog box.
Change navigation mode to G-Force	Ctrl + G	⌘ + G	Switches navigation in the 3D viewer to G-Force mode. This can also be done by selecting the <i>G-Force</i> option from <i>Tools - Options - Navigation</i> .
Change navigation mode to Trackball	Ctrl + T	⌘ + T	Switches navigation in the 3D viewer to Trackball mode. This can also be done by selecting the <i>Trackball</i> option from <i>Tools - Options - Navigation</i> .

3D Viewer Navigation

The following keystrokes control navigation in the 3D viewer. For more information about navigating in the 3D viewer, see [Using the Navigation Controls](#).

Note - The focus must be in the 3D viewer in order for these controls to take effect. Simply click anywhere in the 3D viewer to change focus.

Command	Windows/ Linux Keystroke (s)	Mac Keystroke (s)	Result
Move Left	Left arrow	Left arrow	Moves the viewer in the direction of the arrow.
Move Right	Right arrow	Right arrow	Moves the viewer in the direction of the arrow.
Move Up	Up arrow	Up arrow	Moves the viewer in the direction of the arrow.
Move Down	Down arrow	Down arrow	Moves the viewer in the direction of the arrow.
Rotate Clockwise	Shift + Right arrow, Ctrl + scroll DOWN	Shift + Right arrow	Rotates the view clockwise. The earth spins counter-clockwise.
Rotate Counter- clockwise	Shift + Left arrow, Ctrl + scroll UP	Shift+Left arrow	Rotates the view counter-clockwise.
Show/hide Overview window	Ctrl + M	⌘ + M	Displays or closes overview window .
Tilt Up	Shift + Up arrow, PgUp key, Shift + scroll wheel	Shift + Up arrow, Shift + scroll wheel	Tilts the viewer toward "top-down" view. <i>Tip:</i> to use the <i>Page Up</i> key, make sure <i>Num Lock</i> on your keyboard is off.
Tilt Down	Shift+Down arrow, PgDn key, Shift + scroll wheel	Shift + Down arrow, Shift + scroll wheel	Tilts the viewer toward "horizon" view. <i>Tip:</i> to use the <i>Page Down</i> key, make sure <i>Num Lock</i> on your keyboard is off.
Zoom in	Ctrl + Up Arrow, scroll wheel	⌘ + Up Arrow, scroll wheel, + key	Zooms the viewer in. If your mouse has a scroll wheel in the middle, pull it toward you to zoom in.

Zoom out	Ctrl + Down Arrow, scroll wheel, - key (both keyboard and numpad)	⌘ + Down Arrow, scroll wheel, - key (both keyboard and numpad)	Zooms the viewer out. If your mouse has a scroll wheel in the middle, push it away from you to zoom out.
Stop Current Motion	Spacebar	Spacebar	When the viewer is in motion, stops movement
Reset view to "north - up"	n	(not supported)	Rotates view so that view is <u>n</u> orth-up.
Reset tilt to "top-down" view	u	u	Resets angle to view scene in "top-down" or " <u>u</u> p" mode.
Reset tilt and compass view to default	r	r	<u>R</u> esets angle to view "top-down" and rotates to "north-up" view. Use this feature to orient the earth in the center of the viewer.

Tip - Use the ALT key in combination with most of these keystrokes to move more slowly in the indicated direction.

Tour Mode Controls

When using [touring mode](#) with Google Earth, you can use the following keystrokes to control touring behavior.

Command	Windows/ Linux Keystroke (s)	Mac Keystroke (s)	Result
Start, Play, Pause	Ctrl + Alt + P	⌘ + Option + P	Plays the tour or restarts tour after pausing. The 3D viewer must be in focus in order for this key to work. (Click in the 3D viewer to set focus if you are unsure.)

Side Panel Controls

When the window focus is on either the *Places* panel or the *Layers* panel, use the following keystrokes to control behavior.

Command	Windows/ Linux Keystroke (s)	Mac Keystroke (s)	Result
Select	Spacebar	Spacebar	Toggles the check mark of the highlighted item on or off, showing or hiding display of the item in the 3D viewer.
Next	Down arrow	Down arrow	Selects the next item in the list (either folder or placemark).
Previous	Up arrow	Up arrow	Selects the previous item in the list (either folder or placemark).
Open Folder	Right arrow	Right arrow	If the item selected is a folder, opens the folder to display contents.
Close Folder	Left arrow	Left arrow	If the item selected is a folder, closes it to hide contents from the list view.
Delete	Delete Key	Delete Key	Works only for items in <i>Places</i> panel. Deletes item after confirmation dialog box is accepted.
Change overlay opacity	Scroll wheel	Scroll wheel	After you click the slider, this changes the transparency for an overlay selected in the <i>Places</i> panel when the mouse pointer is positioned on the overlay opacity slider. Scroll DOWN to make the overlay image more opaque, scroll UP to make the overlay more transparent.





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3D Viewer Options

Note - Some of the features described in this section are only available to users of the Google Earth EC product. [Learn more](#).

Google Earth provides a number of 3D viewer settings that you can modify, as well as features you can activate for special 3D display. These include:

- [Display a lat/lon grid over the 3D viewer](#)
- [Toggle between full-screen and window mode](#)
- [Set the view size of the 3D viewer to specific ratios](#)
- [Use the Overview window for additional perspective](#)
- [Modify view settings to suit your preferences](#)
- [Viewing Preferences](#)
- [Memory and Disk Cache Preferences](#)

Note - To show or hide the 3D viewer toolbar, click *Tools > Toolbar*.

Displaying a Lat/Lon Grid

Google Earth provides a special layer accessible from the View menu that displays a grid of latitude and longitude lines over the imagery in the 3D viewer. To turn on the grid do one of the following:

- Select View > Lat/Lon Grid.
- Type Ctrl + L (⌘ + L on the Mac)

The grid appears over the earth imagery as white lines, with each latitude/longitude degree line labeled in an axis across the center of the 3D viewer. You can position a geographical feature in the 3D viewer and determine its basic geo-spatial coordinates using this grid.

As you zoom in, the level of detail of the degree lines increases. For example, from an eye elevation of about 100 miles, Las Vegas, Nevada, appears north of the 36th parallel, and just west of the 115th meridian.

3D Viewer Options

- [Displaying a Lat/Lon](#)

[Grid](#)

- [Switching to Full Screen Mode](#)
- [Setting the View Size](#)
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As you zoom to an eye altitude of just above 2000 feet, you can see that the marker for Las Vegas, Nevada, sits at W115 08'11" and N36 10'29".



The grid lines continue increasing in granularity even after you have zoomed past the base resolution of the earth imagery.

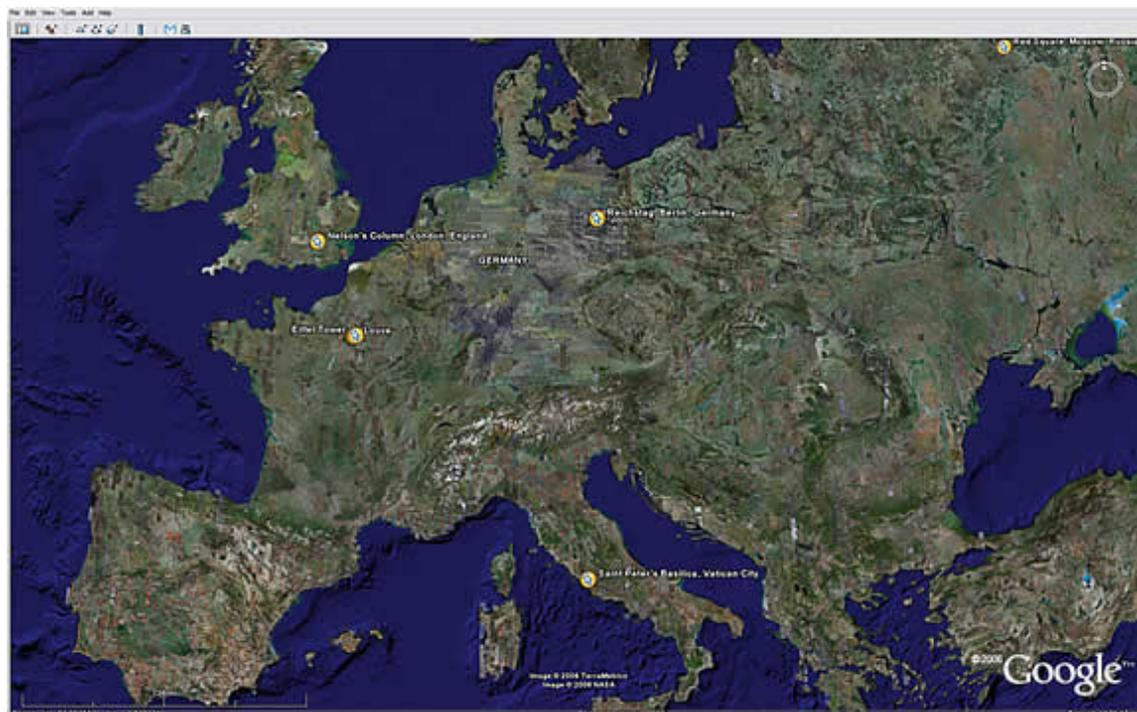
• **Switching to Full Screen Mode**

Note - Currently, this feature is not supported for Mac versions of Google Earth.

You can use the Google Earth application in either window or full-screen mode. To enter full-screen mode, or to return to window mode from full-screen mode:

- Select *View - Full Screen* from the menu
- Press the *F11* key

Switch to full-screen mode for the most dramatic display of earth imagery, such as when touring places or making presentations.



Setting the View Size

Use the *View Size* options in under the *View* menu to select a number of pre-set aspect ratios designed for best playback modes or printing modes. The selected option resizes the 3D Viewer for the best display for your intended purpose. For example, if you have set your computer's display to an overhead projector, you can choose the best aspect ratio supported for that projector. For best video-quality output, choose the appropriate TV view setting.

For playback, you can choose *Computer* or *TV*. For print, you can choose from 4 aspect ratios for different paper sizes (see [Printing Images](#) for more information). The table below lists the settings for each mode.

View Mode	Modes
Computer Playback	320 X 240
640 X 480	
800 x 600	
TV Playback	NTSC (720 x 486)
PAL (720 x 576)	
Print Output View Settings	8.5" x 11", Landscape
11" x 17", Landscape	
4" x 6", Landscape	
5" x 7", Landscape	

Note: Once you choose an aspect ratio, you can always manually resize the 3D viewer.

Using the Overview Map

The *Overview Map* window feature displays an additional view of the earth with a position indicator that corresponds to the current view inside the 3D viewer. In the following example, Google Earth is positioned over the city of Paris, France. The *Overview* window has a cross-hair marker to indicate the position of the view in relation to the entire earth.



To show or hide the Overview Map window, do one of the following:

- Click *View > Overview Map*
- Click CTRL (⌘ on the Mac) + M

Overview Map Features

You can use the *Overview Map* window to:

- Determine position of the current view relative to the entire earth

For example, if you open a KMZ file from the Google Earth Community, the 3D viewer might fly quickly to a detailed view on the earth that you are unfamiliar with. You can open the *Overview Map* window to see the position of the current view relative to the entire earth. As you adjust the position of the 3D viewer, the indicator in the Overview map continually adjusts to reflect the current position in the 3D viewer.

- Control the motion in the 3D viewer itself

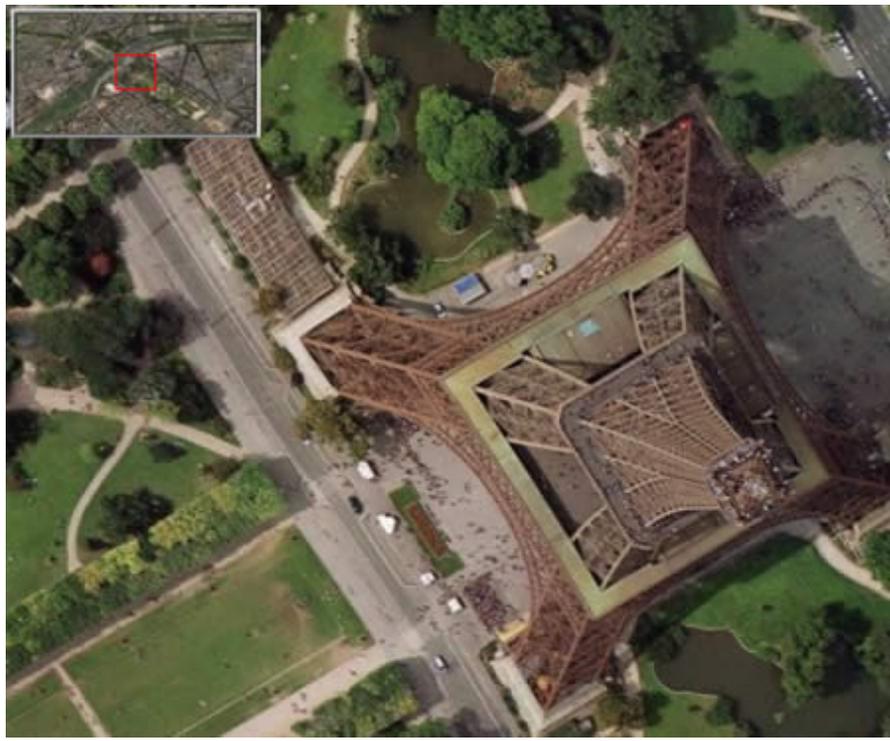
While the *Overview Map* window responds to position adjustments in the 3D viewer, you can also interact directly with the *Overview Map* window itself. Double click on any area within the window and both the overview display and the 3D viewer adjusts position to the point in the *Overview Map* window that you click on. For example, if the current view is located in the United States, you can double click on the African continent and both the *Overview Map* indicator and the 3D viewer will move to the new position.

Adjusting the Overview Map Size and Zoom Ratio

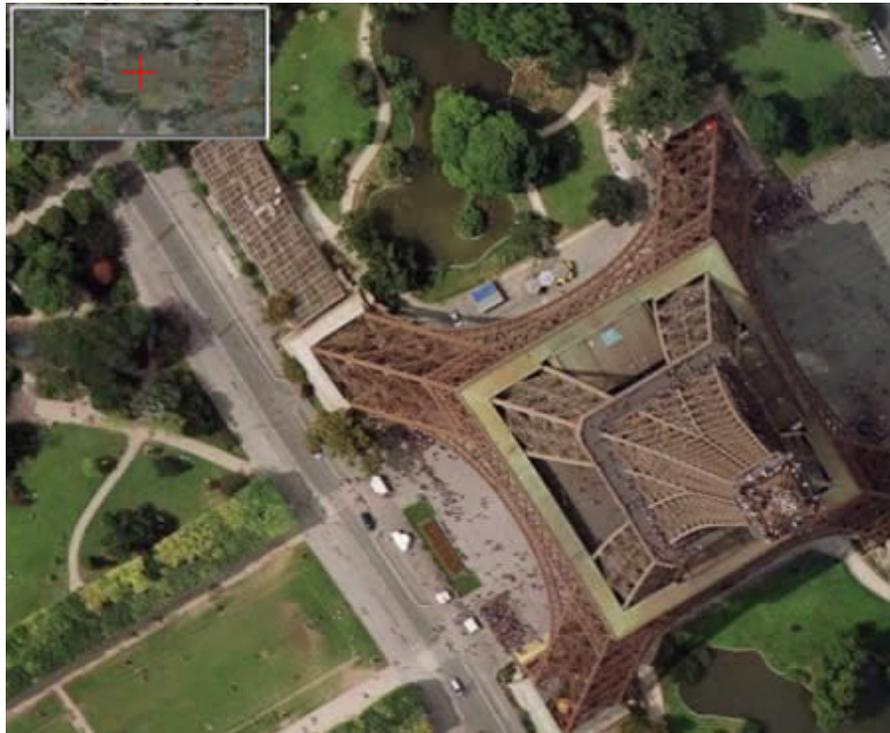
To adjust the [Overview map](#) preferences, select *Tools > Options > 3D View* (Mac: *Google Earth > Preferences > 3D View*). Adjust the slider control in the Overview Map options to scale the Overview map from small to large.

Using the settings in the *Options > 3D View* tab, you can also adjust the ratio of territory displayed in the Overview Map window relative to that in the 3D viewer. This ratio has three basic elements:

- **1:infinity** (default setting) - Here, the entire map of the earth is displayed in the *Overview Map* window regardless of the amount of territory displayed in the 3D viewer. This is shown above in the Paris example. **1:1** - The view in the *Overview Map* window corresponds exactly to that in the 3D viewer. As shown below, the *Overview Map* window now draws the bounds of the current view using a red bounding box. A small amount of the territory outside the current 3D viewer is displayed in the Overview window.



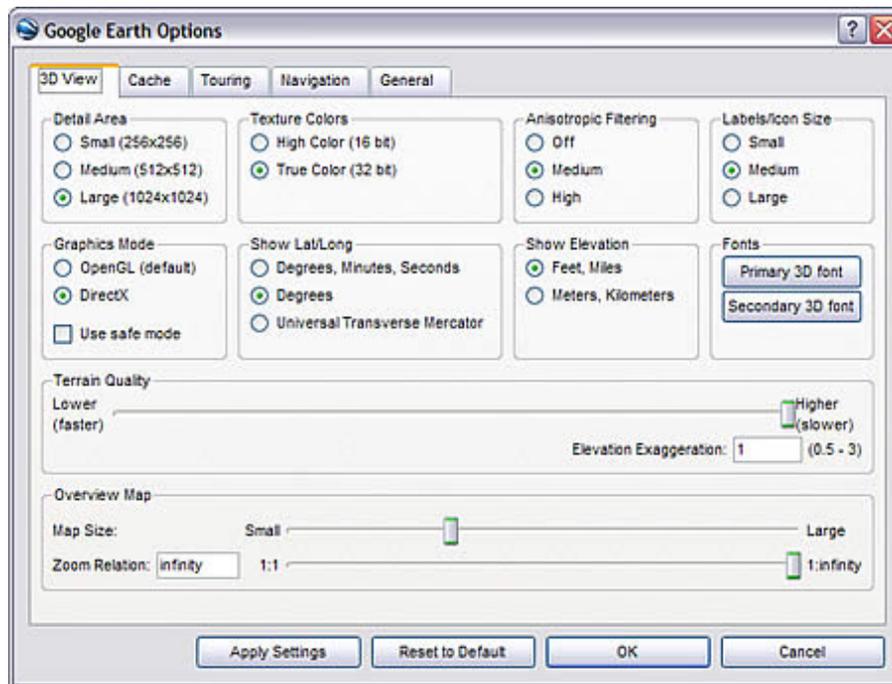
- **1:n** - Here, n corresponds to any number you set, multiplied by the current view. This creates a relative "zoom" factor, so that you can choose to zoom out from the current view by 10, 50, or any other factor. The example below shows the same close-up view of a Paris building with the zoom factor adjusted up to 260.



Viewing Preferences

You can set a number of preferences to affect 3D viewer imagery, as well as how icons, labels, and other elements are displayed. To access these settings, do the following:

- **Windows/Linux:** Click *Tools > Options > 3D View*.
- **Mac:** Click *Google Earth > Preferences > 3D View*.



Keep in mind that some enhancements affect Google Earth performance; that is, the more enhancements, the more your computer's resources are required.

- **Detail Area** (focus) - The Detail Area sets how much area of the 3D viewer that has high-resolution focus. This is calculated in pixels. To optimize performance for the majority of computers, Medium is set as the default area size (512 x 512 pixels). Large is recommended only for computers with a minimum of 32 MB of graphics card memory, as this is a memory-intensive feature. Note that this is automatically set to a higher detail level if you have a more powerful graphics card. You can improve performance of Google Earth by choosing a smaller setting, but at the cost of less high resolution focus.



1. Gradually diminishing detail
2. Detail area in high focus

- **Texture colors** - Modify this feature to set the number of bits used to represent colors in the 3D viewer. True Color (32 bit) produces a more realistic view.
- **Anisotropic filtering** (smooth horizon) - Anisotropic filtering is a method used to filter pixels in texture mapping in order to produce a smoother looking image. Enabling this feature produces a

much smoother image around the horizon when viewing the earth from a tilted angle. It also requires more graphics card memory, so use this option only if your graphics card has at least 32 MB of memory. By default, this option is set to Off.

- **Labels/icon size** - Use this feature to change the default size for labels and icons in the 3D viewer. A setting of Small is optimal for detailed urban areas where crowding of labels and icons often occurs, but if you typically look at both large and urban areas, choose Medium so that placemarks viewed from higher elevations appear in the 3D viewer. See also [Tuning Display of POIs](#).
- **Graphics mode** - Most graphic-intensive computer applications (including Google Earth) rely upon one of two possible 3D rendering capabilities on your Windows computer: either OpenGL or Direct X. On Linux and the Mac, Google Earth only supports OpenGL. Because OpenGL is the rendering software for most graphics cards, Google Earth uses that mode by default. However, your system might require DirectX (Windows), or your system might run best in safe mode. When you start Google Earth, you can select the rendering of 3D imagery best suited to your system hardware. If you are using Windows, Google Earth tries to determine which setting is most suitable for you graphics card and automatically suggests that you switch.

(Windows only) There are two ways to choose either OpenGL or DirectX as your 3D graphics rendering software:

- **Start Menu Selection** - Select Set DirectX as the Default Renderer from Programs - Google Earth under the Start menu of your computer, or choose Set OpenGL... After selecting the graphics mode, a dialog box alerts you to the selection, and you can start Google Earth to run in the chosen graphics mode.
- **Graphics Mode Selection** - Select OpenGL or DirectX from the Graphics Mode section of the Google Earth Options dialog box.

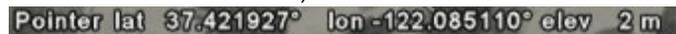
Select the "Safe Mode" feature when you notice problems with the Google Earth 3D viewer. This option turns off such advanced rendering features as mipmap texture rendering and filled polygons, thereby reducing the amount of work for your graphics cards. If the problem is resolved after turning on this feature, the problem is likely due to your graphics card or graphics card driver. For more information, see [How do I upgrade my graphics card driver?](#)

- **Show Lat/Long** - As you move the mouse pointer in the 3D viewer, latitude and longitude coordinates are displayed in the lower left corner of the 3D viewer.

By default, the display of these coordinates is in degrees, minutes, seconds (e.g., 37°25'18.94"N 122° 05'06.30" W).



You can choose the Degrees option to display geo-coordinates in degrees decimal (e.g., 37.421927° -122.085110°).



Additionally, you can display these coordinates using [Universal Transverse Mercator](#) (e.g. 580954.57 m E 4142073.74 m N)

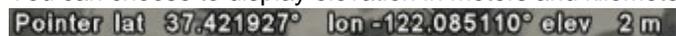


- **Show Elevation** - Set the elevation measurement units as they appear Google Earth.

As you move the mouse pointer in the 3D viewer, the elevation of the terrain beneath the pointer is displayed in the lower left corner of the 3D viewer. By default, the display of elevation is in feet and miles when high enough.



You can choose to display elevation in meters and kilometers.



- **Fonts** - Adjust the font size and appearance for text as it appears in the 3D viewer. In most cases, use the primary font setting, as the secondary font setting is only for rare circumstances when there is a problem with your primary font. Use the secondary if your label data has characters in it that are not available in the default font of Arial.
- **Terrain quality** - Use this slider to set the terrain quality to be lower (less detailed) quality with better performance or to be higher (more detailed) quality with slower performance. To adjust the appearance of hills when you have terrain turned on in the 3D viewer, you can set the Elevation

Exaggeration value from 0.n to 3.0, including decimal values. The default setting for this value is 1. Typically, settings higher than 1.5 create an overly exaggerated appearance for most terrain. See also [Tilting and Viewing Hilly Terrain](#).

- **Overview Map** - See [Adjusting the Overview Map Size and Zoom Ratio](#).

See also [Showing or Hiding Items in the 3D Viewer](#).

Memory and Disk Cache Preferences

By increasing your memory and disk cache size, you can improve performance ([see considerations below](#)). To do this, follow the steps below:

1. Click *Tools > Options (Google Earth > Preferences on the Mac)*. Click on the *Cache* tab.
2. Enter any very larger number in the *Memory Cache Size* field. You do not need to know the actual limits of your computer's memory because Google Earth automatically limits the size according to the physical memory available on your PC.
3. Enter any number less than 2000 in the *Disk Cache Size* field.

Increasing the size of memory or disk cache can improve performance but can adversely impact the performance of other applications. Available memory is dependent on the specifics of your computer. Increasing memory cache significantly improves performance for [printing](#) and [movie-making](#) with Google Earth Pro and Google Earth EC. Disk cache is limited to 2GB. Google Earth uses this cache when you are viewing imagery offline. This enables you to view the earth without an Internet connection.

You can recover some disk space by deleting the disk cache. To do this:

1. Click *File > Server Logout*.
2. Select *Tools > Options (Google Earth > Preferences on the Mac)*. Click on the *Cache* tab.
3. Click *Delete Cache Files*.

