

Obtaining Aerial Images from Google Earth

Introduction


This tutorial will show you how to use the Google Earth application to obtain a site-wide aerial photograph for a modeling project. The tutorial will use the test case file included with the BEEST for Windows software to illustrate the process.

Install Google Earth

If you do not have the Google Earth application installed on your computer, you can obtain it from the website <http://earth.google.com/>. Visit this website and click the Download button to obtain the latest version of the program (currently, version 5.0). On the next page, click the “Agree and Install Earth” button and save the file “Google Updater.exe” to your computer. Run this program, and it will download and install Google Earth. Close the updater program after the installation is done.

Locate Facility

Before downloading an image from Google Earth, its center and extents need to be determined. In this tutorial, the image will be for the area covered by the facility in the test case file.

Open BEEST and Google Earth. In BEEST, click File → Load and Run Test Case to load the test case file. Click the Zoom In  button four times to see the building and source defined in the model. The location of the building will be used to center the aerial image. In Google Earth, click Tools → Options and set the “Show Lat/Long” option to “Universal Transverse Mercator.”

You will need to convert the building location from UTM to latitude and longitude to use it in Google Earth. Coordinate conversion can be accomplished using a program such as Corpscon from the U.S. Army Corps of Engineers. The latitude and longitude for the building are shown in Table 1.

UTM	Latitude and Longitude
358,132.96 meters East 3,936,223.66 meters North Zone 17	35.559538 °N 82.565346 °W

Table 1: Building location.

In Google Earth, find the Search box on the left side of the screen and click on it. Click the text box inside the “Fly To” tab and enter “35.5595 N, 82.5653 W” (without the quotation marks). Press the Enter key and Google Earth will adjust the image to zoom in on the facility. Your screen should look similar to Figure 1.

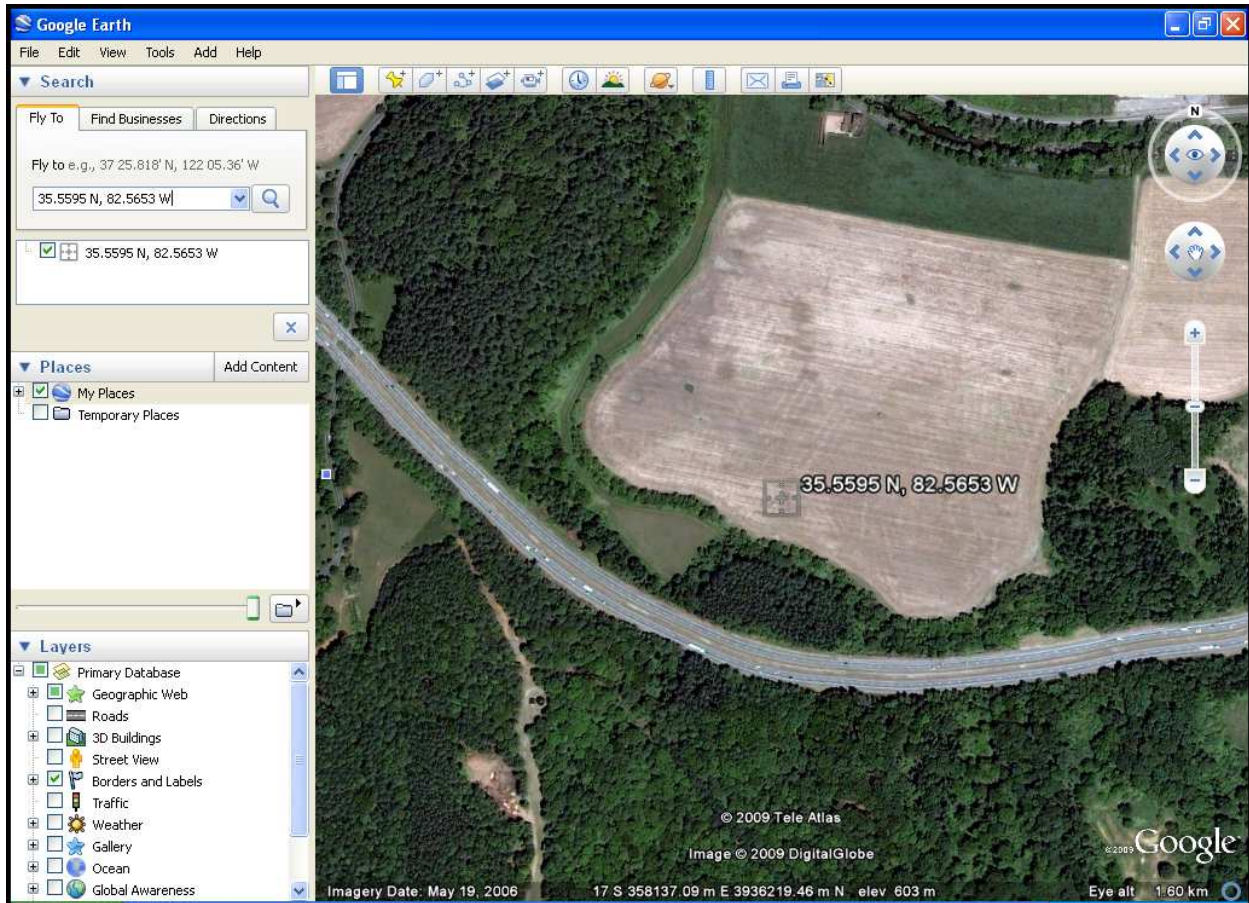


Figure 1: Building location in Google Earth.

Define Image Boundaries

After locating the facility in Google Earth, you will need to determine how much of the area around the central point to include in the image. This is done by adding placemarks to the image to identify its southwestern and northeastern corners.

Go to the toolbar at the top of the screen and click the “Add Placemark” button. A window will pop up with the placemark’s name, shape, and coordinate. Delete the name and drag the popup window to the left side of the screen. You will see the placemark in the center of the screen. Click it and drag it southwest of the building. Click the yellow pin button in the popup

window to select a different shape for the placemark. Select the “Cross Hairs” shape and set its color to yellow. Click OK twice to save the placemark.

Repeat this procedure, but this time place the mark to the northeast of the building. Click the checkbox next to the placemark underneath the “Fly To” search box to hide the placemark Google Earth generated for the building. Your screen should now look similar to Figure 2.

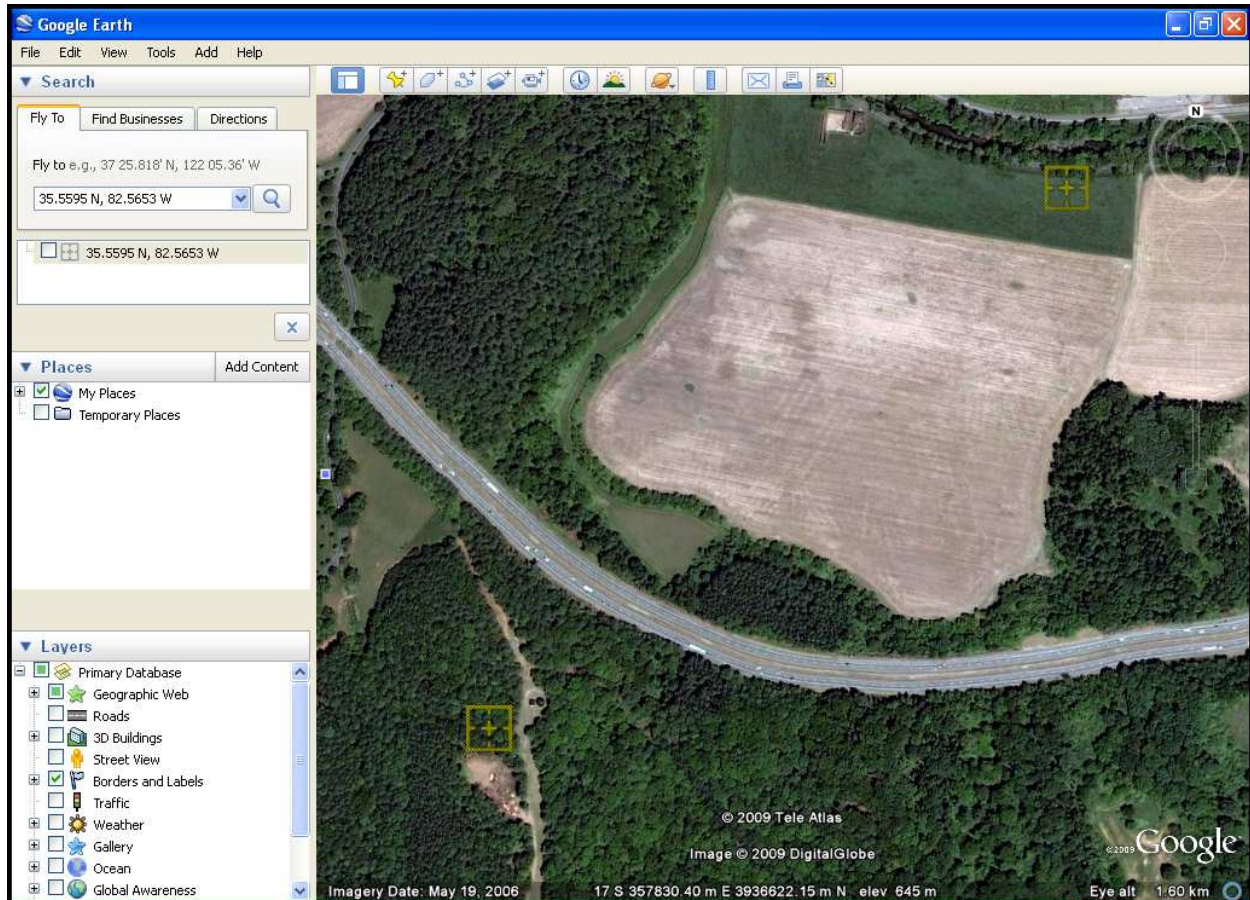


Figure 2: Image boundaries.


Save Image

Click File → Save → Save Image in Google Earth. Name the file “test.jpg” and save it to a folder on your computer. Open an image editor program such as Windows Paint and open the file test.jpg within the editor. Select the area from the center of one placemark to the center of the other placemark. Click Edit → Copy, and then File → New to create a new image.

Click Image → Attributes and enter the width and height of 1; click OK. This will prevent whitespace from appearing around the aerial photograph. Click Edit → Paste, and then save the

new image with the name aerial.jpg. Copy the file to the modeling project folder, which is C:\Beework for the test case.

View Image in BEEST

Click the “Show Background Map”  button in BEEST. Click the File button to browse for the image location. Find and select the file aerial.jpg. You will now be prompted for its southwest and northeast corner coordinates. This prompt is shown the first time you load the image; after that, BEEST sets the coordinates automatically.

Switch to Google Earth and hover your mouse over the placemarks you previously created. Right-click on each placemark, then click “Properties.” This will display the latitude and longitude, which will need to be converted to UTM coordinates. For the test case, the coordinates are shown in Table 2 on the next page. Enter these coordinates into BEEST and click the “Save Locations” button. Click the “Show Map” button to make the aerial photo appear in BEEST, as shown in Figure 3.

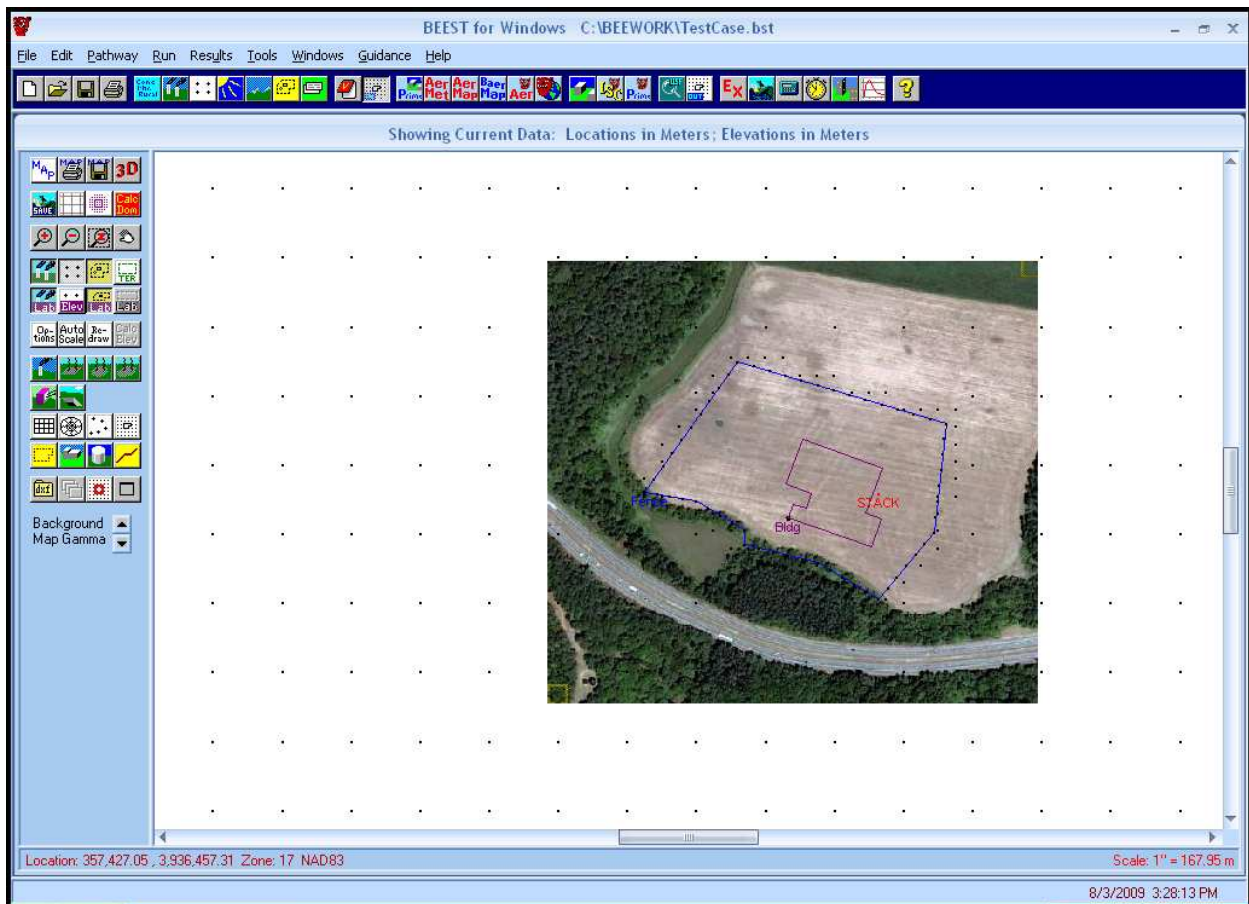


Figure 3: Aerial image imported into BEEST.

	Southwest Corner	Northeast Corner
UTM Easting (X)	357,783.253	358,493.903
UTM Northing (Y)	3,935,952.268	3,936,595.013

Table 2: Corner coordinates.

Limitations

Site-wide aerial photographs obtained as discussed in this tutorial correspond closely to the actual facility locations on the surface of the Earth. However, there are three sources of error associated with this method of obtaining aerial photographs:

- Select the area between placemarks carefully when saving the image.
- Make sure that the top of the screen points north and that you are looking straight down at the Earth before you save the image in Google Earth.
- The farther you zoom out from the center of the facility, the less closely Google Earth's coordinates correspond to the real coordinates on the surface of the Earth.