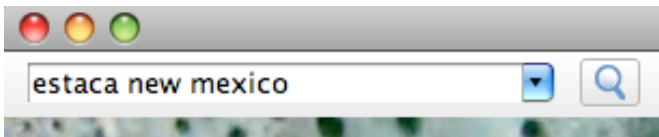


Generating Site Maps & Reports with Google Earth

Note: These instructions, which can also be downloaded online at <http://www.harvestingrainwater.com/rainwater-harvesting-infosources/water-harvesting-handouts/>, were created for Macintosh OS X.5. If you are using a PC or another Mac OS, you can expect to need to use some slightly different methods to achieve these results, and that the appearance of your tools will also vary. Google Maps also has a Google Earth Plug-In available which allows you to access many, if not all, features of Google Earth previously available only through the application version.

Locating the Site with Google Earth

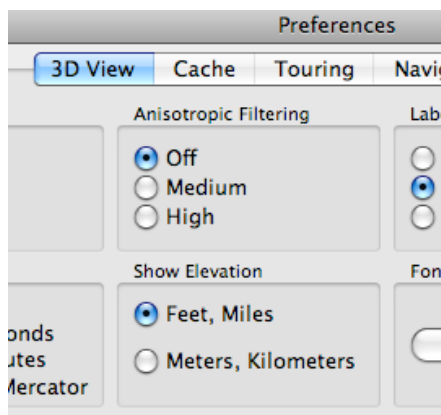
Open Google Earth and enter the target address in the box in the upper left-hand corner.



Hit Enter or click the Magnifying Glass button. This will deliver a relatively zoomed out view of the property and the surrounding area.




If a scale legend like the one above is not visible in the lower left corner of the screen, go to the View menu and select Scale Legend. If the scale legend measurement is given in metric units and you want to use standard U.S. units, hit command-comma (or go to the Google Earth menu in the toolbar and select Preferences...) to open the Preferences window. From the 3D View tab, go to the Show Elevation panel and click the radio button for Feet, Miles. Click Apply, then OK.

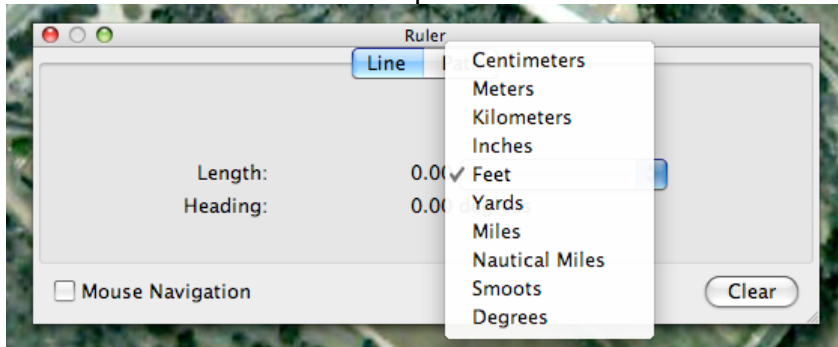


While you are zooming in closer, hit the U key periodically to return the view to a straight-down orientation. The scale will not be even remotely accurate for the purposes of site consultation unless you are looking straight down at the site. *Note: If you use your computer's plus & minus keys to zoom, the angle will not tilt while zooming. You can turn off the automatic tilt function by going to the Preferences window, clicking on the Navigation panel, and deselecting "Automatically tilt while zooming."*

In order to calculate the approximate scale of the image shown on your screen, divide the number of feet represented by the full length of the scale legend (385 feet in the image above) by the length in inches of the actual scale legend on your screen (it was 2.75 inches long on my screen). This will give you a decent idea of how many feet-on-the-ground are represented by each inch-on-the-screen. In this example, each screen-inch represents 140 ground-feet. You can also work backwards to customize your scale to suit your needs. If you know you want each screen-inch to equal 140 ground-feet, for example, and you know that your scale legend is 2.75 screen-inches long, multiply these two numbers together (to get 385) and then zoom in to the point where the full length of the scale legend represents 385 feet. *Note: Due to the curvature of the earth and limitations of technology, these numbers will not be completely accurate. Technology, as handy as it can be, is no substitute for reality!*

If you would like to double check your scale, use the Ruler tool to create a line on the screen whose GE-stated length you can compare to its length measured with the appropriate scale ruler.

To use the Ruler tool, click on the ruler icon button  in the toolbar. Open the Line panel from the Ruler window and use the drop-down menu to select the desired units.



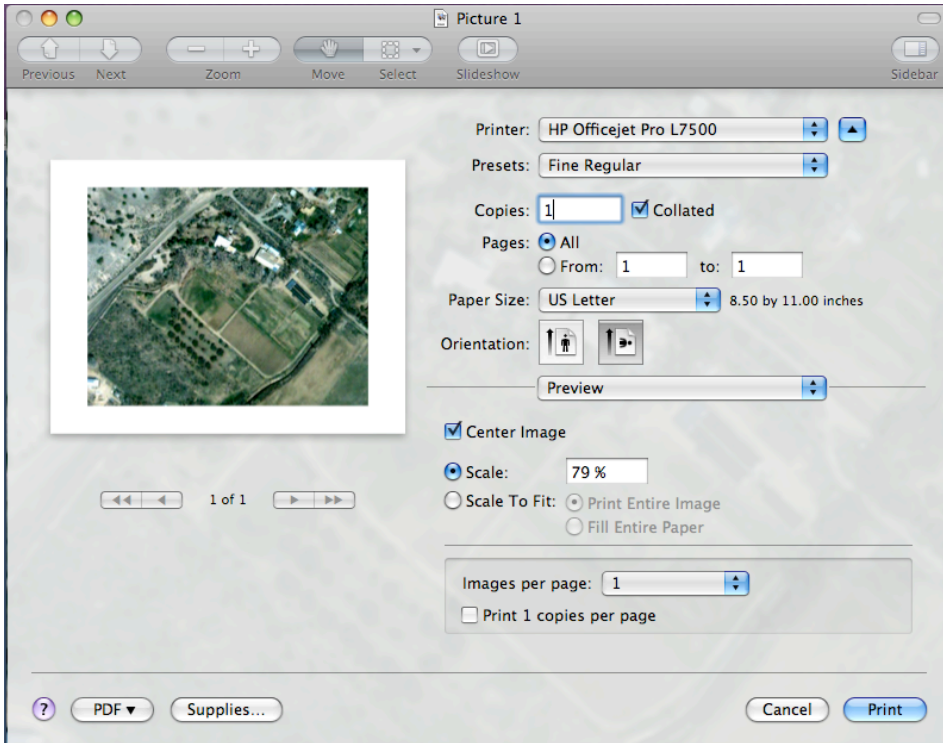
Uncheck the Mouse Navigation box if it is checked. Move the Ruler window out of the way to one side, as it must be left open to use the tool. Click, drag and release to draw one line at a time. The length of each line drawn will be displayed in succession in the Ruler window. Click the Clear button, or begin to draw a new line, to remove a previously drawn line. Click on one end of an existing line and drag that end to a new location to pivot the line to a new location with a common terminus. You can use this Ruler tool or your scale ruler to measure the relevant building lengths and property distances. Until you become familiar with this process, consider making initial measurements from the screen, and compare them to your printed-to-paper version to make sure your scale is being preserved in print, as the computer does not preserve scale on its own from the digital form of a document to its printed form*.

Creating & Working with a Screen-Shot Image of the Site

Without changing the zoom level, use the screen shot function (shift-⌘-4, then click, drag, and release on a Mac) to take a picture of the lot, right up to and including a little bit of the street if possible. This screen shot will end up as a PNG file on your desktop titled Picture 1 (or the next available number if you have previously-snapped screen shots on your desktop). If north is not toward the top of the image, note which edge of the property is to the north.

To preserve the scale you created above as you transition from digital to printed format, print this file as an unmodified PNG, or as an unmodified image Saved As a JPG. Open the print window and set the page orientation to portrait or landscape based on the orientation of the image. Change the scale to print at 79%* of full size (see below for visual instructions). To apply this change of scale, click in the Copies field, or the one of the Pages From fields. Making this scale adjustment will allow you to measure distances on the printed page with the side of a scale ruler that corresponds to the scale in the table




above*. Again, due to the curvature of the earth and limitations of technology, these numbers will not be completely accurate. Technology, as handy as it can be, is no substitute for reality!



Using PowerPoint to Label the Image

If you would like to superimpose numerical values or text over your image, one way this can be done is by importing the image into PowerPoint. If you know of a better way to do this, we'd love to hear about it! Otherwise, open a new PowerPoint presentation and get to a blank slide.

To preserve your original scale onto the printed page*, click on the green resizing button in the upper left corner of the presentation window, and completely collapse both the sidebar to the left and the notes section below the blank slide. This should yield a blank slide whose dimensions are 7 3/4 by 5 13/16 inches. From the Insert menu choose Picture ►, then From File.... Browse and select the PNG file (Picture "X") from the desktop. Do not resize the image.

Use the Line tool  and line style (and color tools  if you want) to outline the sections of the roof based on which direction the rainwater will flow. Include any outbuildings as necessary. Calculate the area of each section of roof. Insert a text box  into each section of roof, as well as a text box to indicate North. If there is room, indicate the area of each section of roof right on each section. If it seems helpful, include the measurements you used to calculate the areas, as in this example:



If the roof is too complex to include your data right on it, label each section of roof with a letter. Later, in Word, create a text-box key with the letters and their corresponding actual values.

Take a screen shot of the entire labeled image. In the process of printing the resulting Picture 2, change the scale in the print window to 82%*. Remember to click in another field of the Print window to apply the scale adjustment.

Accessing Topographic Maps in Google Maps

Although the topographic maps available through Google Maps are not consistently available for all regions of the globe, and are not necessarily very detailed, they can be helpful when other alternatives are few, or difficult to obtain.

To check for and view a topographical Google Maps, simply locate the site, hover over the More button in the upper right region of the window, and check the Terrain box in the menu that appears. If the Terrain box is greyed out (not available), zoom out one level and try again.

Note: the contour interval will change depending on the scale of the map, so pay attention accordingly.

City of Tucson Digital Map Site

This tool offers local users a more detailed aerial picture than Pima MapGuide, all the same measurement features of the county site, and will operate in any browser, unlike Pima MapGuide, which operates on only a PC platform. You can use the City of Tucson Digital Map Site outside of city limits also. If you are looking for a similar tool for another region, check with that region's local government, as many municipalities now offer such free, web-based services.

To access the tool, visit dot.tucsonaz.gov/mapcenter/. Click on "Planning and Development Services" next to the purple pin. Use the tiny bulletin board in the upper left corner to pull up the layers. Measurement abilities are under "Tools," the rest is pretty self-explanatory.

Creating a Site Summary in Word

Open a blank Word document and use the site address as the title.

Visit Google Maps' street view of the property (available via the Google Maps toolbar button in Google Earth), and take a screen shot of the front view of the property. You can scroll left and right to find the most helpful view of the property. Return to the Word document and insert this image by clicking on the Insert menu, selecting Picture ►, and From File.... Browse to find the image, and click the Insert button. If the image you want to insert is on your desktop, you can drag and drop it into place right in the Word document. You can click on this image and then drag one of its corners to resize the image.

Insert a text box by going to the Insert menu, selecting Text Box (Frame), and then clicking, dragging, and releasing to create the text box in your document. Resize if needed. In this text box, include any numerical values (lengths, areas) that were not added in PowerPoint. Include roof section areas, total roof area, lot dimensions, total lot area, and any other useful information.

*** Troubleshooting scale inconsistencies:** First, it's best to print only one scale-sensitive image per page, and perhaps print only one page at a time if you are having trouble preserving your scale. Below is an example of how to correct the scale if the instructions above have not kept it consistent in the digital-to-print process.

Let's use the example above. The scale on the screen for the whole property was one inch:140 feet, so when I printed the PowerPoint-treated image at 82% as indicated above, I expected the green line representing the 770 feet between the road and the river to measure 5.5 inches (on-the-ground measurement in feet ÷ number of feet to an inch = expected number of inches on the page). In this case, $770 \div 140 = 5.5$). However, when I measured the line on the printed page, it measured 6.3 inches. To correct this, I divided the expected measurement (5.5 inches) by what the line actually measured ($5.5 \div 6.3 = 0.873$). I then multiplied the scale at which I had originally printed the image (82%) by this result (0.873); the result (rounded to the nearest whole number) was 72%. When I reprinted the image, I put 72% in the scale field, and voilà: the line on the printed page measured exactly 5.5 inches. Whatever it is that causes these inconsistencies, this method should work to correct them.