

## **Digital Mapping Resources for Scouting**

by Mark Lee

The availability of affordable GPS receivers has not eliminated the need for paper maps and compass skills in Scouting. For one thing, batteries can run down and a GPS can fail. A wise and safe navigator *never* relies on only one source of navigation information, especially in remote areas! A GPS unit will make your navigation easier, faster and more accurate, but a map and compass provides a prudent safety backup.

But the best backup is useless unless you can use it effectively. Using a paper map and compass *with* your GPS will keep your map skills from getting rusty. In fact, a good paper map will make your GPS navigation easier. The digital mapping data in GPS units continues to improve, but due to their portable, packable design, all outdoor GPS units have fairly small screens. A larger paper map will give you instant situational awareness over a much wider area than the GPS screen can show at one time. And, the GPS can tell you precisely where you are on the bigger paper map. Together, these two tools will improve your navigation capability.

One simple technique can also extend your GPS battery life on a wilderness trek. Every once in awhile, pause to check your position with the GPS, and confirm where you are on your paper map. Determine your direction of travel, then turn off the GPS and tuck it into your backpack. As you travel, you can spot check your position and route by map and compass. This lets you move cross country without constantly running the GPS and consuming battery power.

So, where can you get maps to supplement the GPS in your pack? Today, outdoor navigators can choose their maps from traditional providers, make their own with consumer software, or access free mapping resources on the Internet.

This paper will discuss some of the free and commercial electronic mapping resources that are available to Scouters today. Instructions will be provided for creating your own paper maps with various on-line tools.

### **WARNING:**

**The screenshot maps you can make with the following instructions are not true scaled maps. Alone, they are not suited to wilderness navigation with a compass. They are intended as supplements to scaled maps and mapping GPS receivers.**

### **Photo Software for Screen Capture**

In simple terms, we're going to show you how to find free maps on the Internet, then make screenshot pictures of them suitable for printing personal maps.

### **Required Tools**

1. Computer with Internet connection.
2. IrfanView photo editing software (free).
3. A computer printer or plotter.

There are numerous photo editing or screen capture programs available for sale or for free. Some come with your computer's operating system, some are bundled with scanners and digital cameras, and others are available for free Internet download. Google search engine's [Picasa](#) photo editor is a popular free program. You may own a copy of the powerful but pricey Adobe Photoshop.

As a photographer and technical writer, I have used several of these photo tools. A few of the techniques we will describe here will work with more than one software tool. But these instructions are written

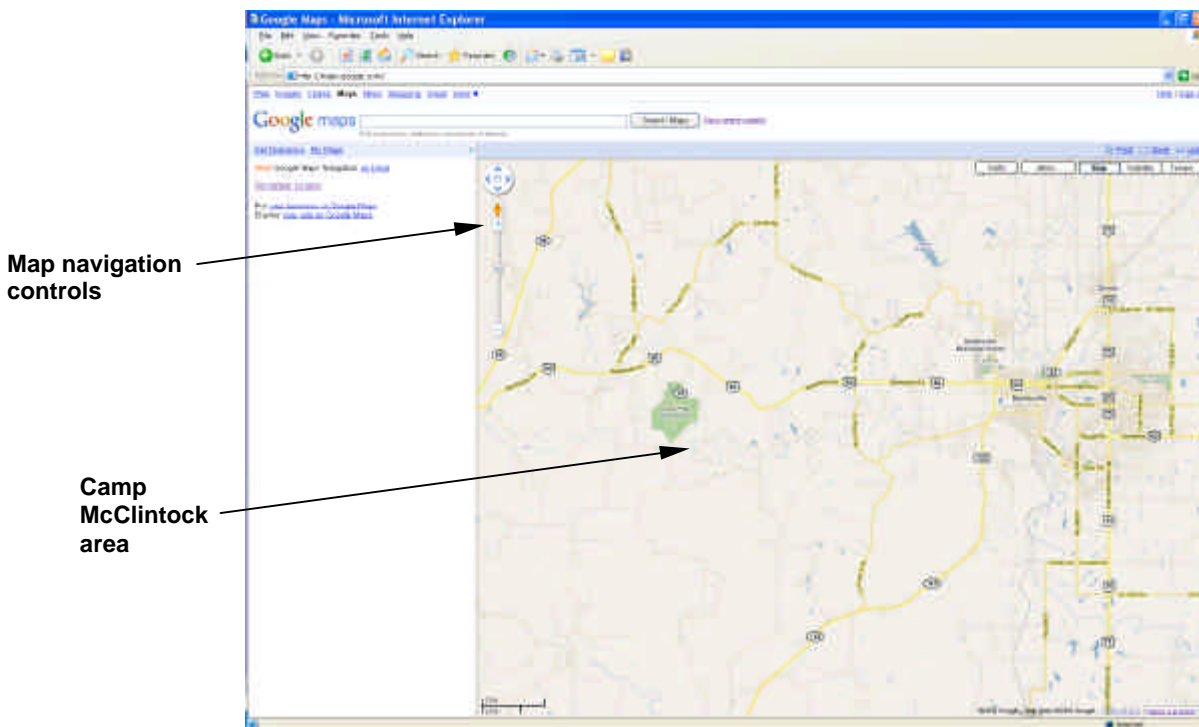
around the free IrfanView program, available from <http://www.irfanview.com>. IrfanView is an image editor that is fairly powerful, full-featured, simple to use, can run from a USB jump drive and can output JPEG photo files or Adobe Acrobat PDF document files.

When you download and install IrfanView, remember to also download and install the plug-ins, which provide many of the program's functions.

### Create Google Satellite Photo Map

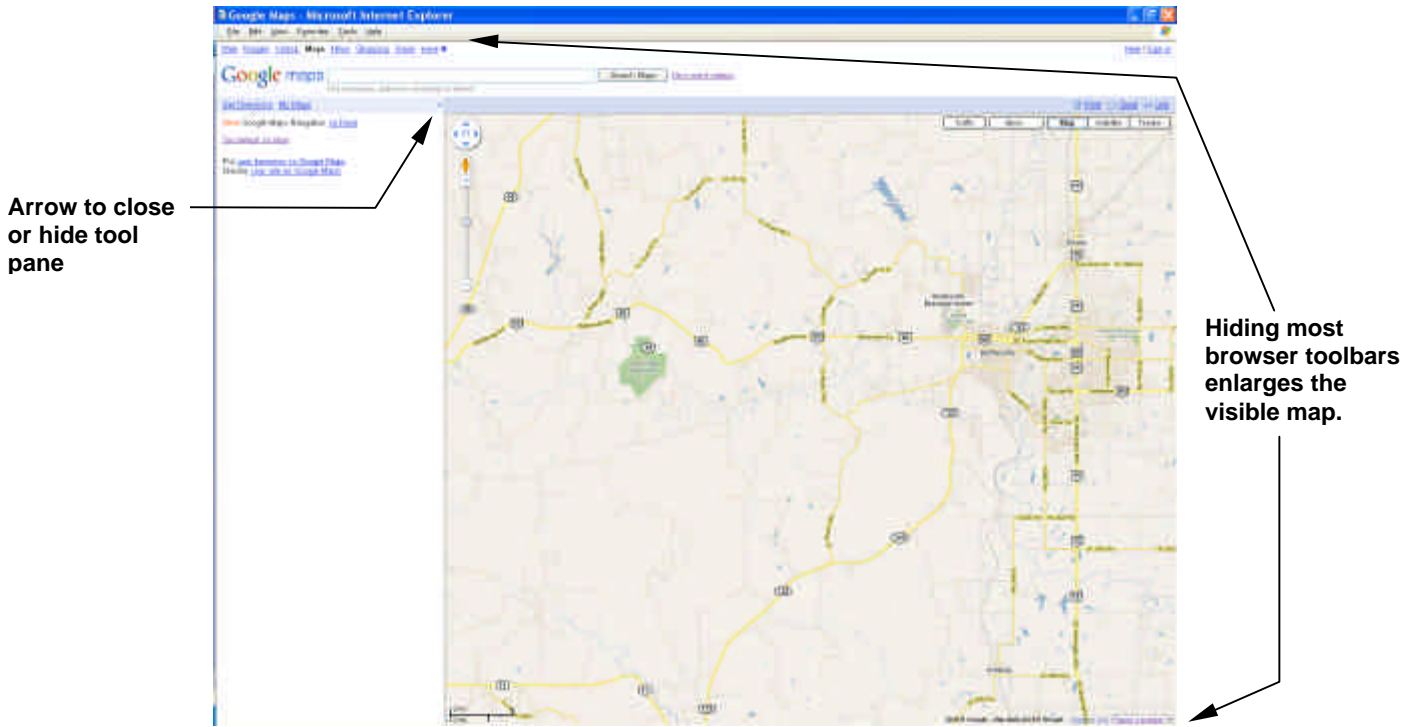
In these instructions, we'll use one of the popular digital map sources, Google Maps. In general, these techniques will also work for any mapping display you can call up on your computer.

1. Open IrfanView photo editing software and minimize it.
2. Log-on to the web site Google Maps (<http://maps.google.com>).
3. Using the map controls, navigate to or search for the desired location. In this example, we are going to prepare maps of BSA Camp McClintock, near Osage Hills State Park southwest of Bartlesville, Oklahoma. See the following figure.

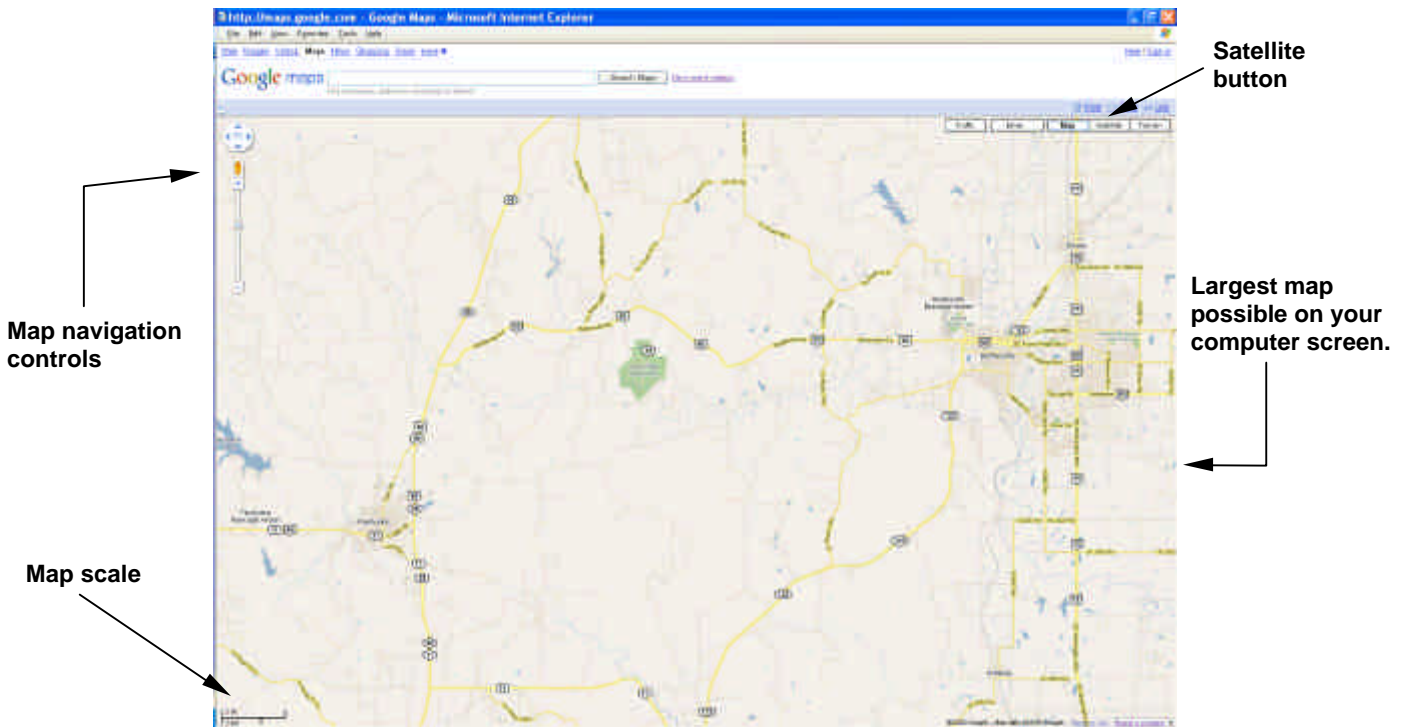


4. Now set up the Google Maps display window to get the largest possible map image.

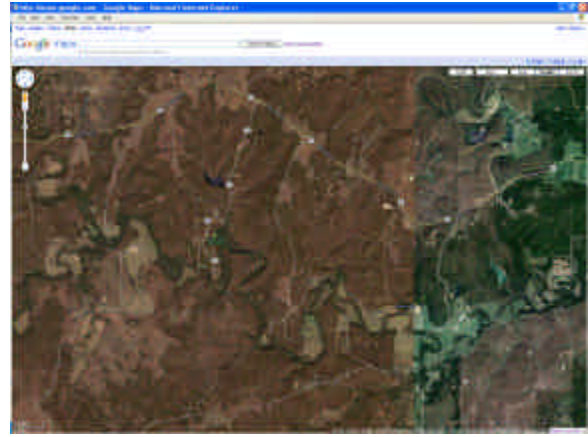
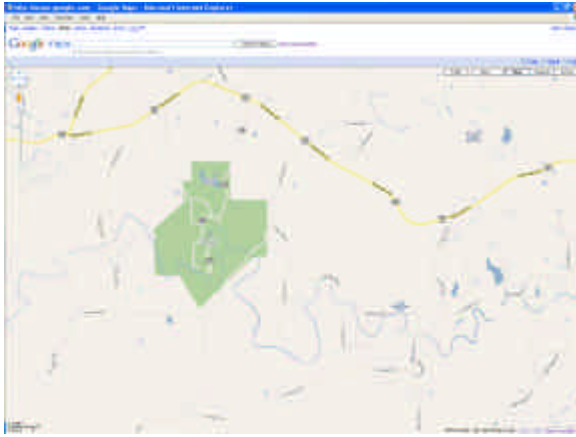
A. First, turn off all the unnecessary toolbars in your browser window. In this version of Internet Explorer, click **View|Status bar** to turn it off. Next click **View|Toolbars** and uncheck **Address Bar** and **Standard Buttons**. The screen will look like the following figure.



B. Now in Google Maps, click the small double arrow icon << near the top left corner of the map (see figure above) to close the left tool panel. This expands the map window even more. The result is shown in the following figure.



5. Now display the exact area you want to map. Use the navigation controls and move around the map by panning north, south, east or west and by zooming in or out. We're going to zoom in to where the scale at lower left says 2000 feet. We could take a screenshot picture here and make a road map if we desire (or a Terrain topo map). But we want a photo map this time, so click the **Satellite** button at top right (see figure above).



At left, Google standard Map display. At right, Satellite photo map display of the same area.

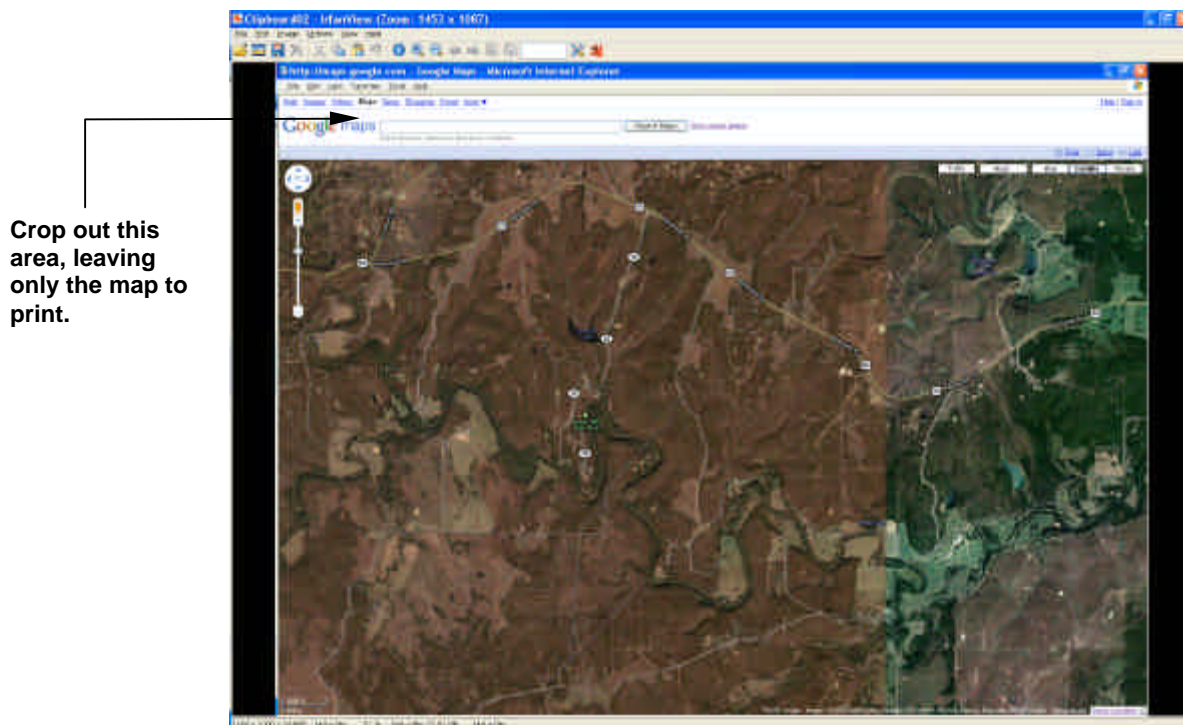
**Tip:**

*Mouse over the **Traffic**, **More...**, **Map**, **Satellite** and **Terrain** buttons for additional features. You can display landmark labels and overlay roads, or turn them off.*

6. Now take a screenshot of the Google map display. On most Microsoft Windows operating systems, the keyboard command is **Alt+Print Screen** or **Ctrl+Print Screen**. On my PC, Alt+Print Screen will copy to the Windows clipboard a screenshot of the active program window. If I press Ctrl+Print Screen, the entire Windows desktop view is copied to the clipboard. For best results, use the command that only copies the active Google Maps browser window.

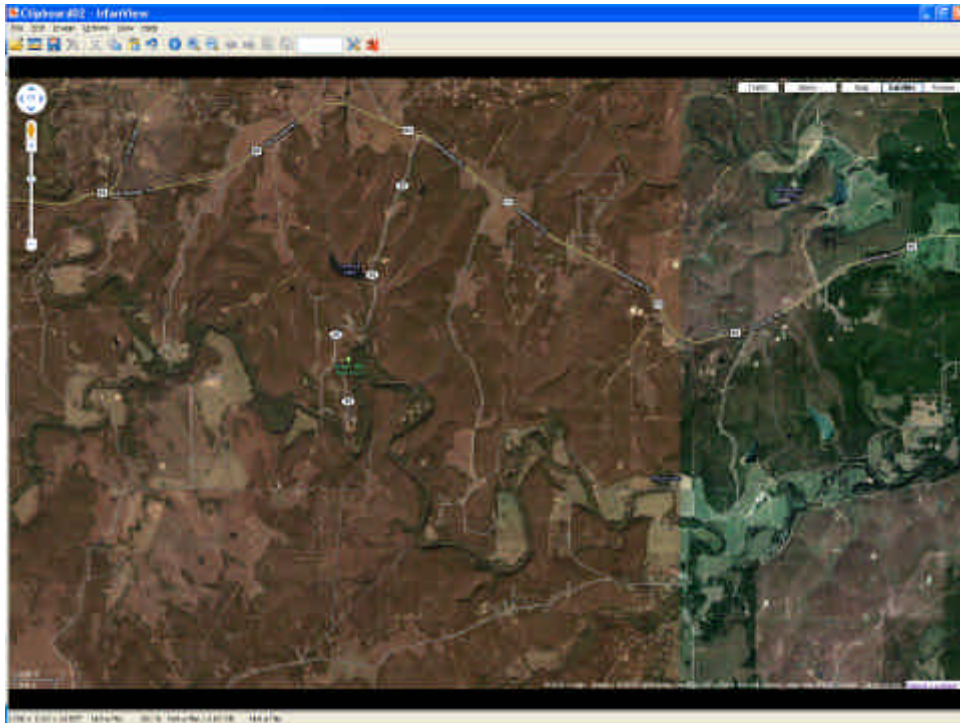
7. Minimize Google Maps and maximize the IrfanView photo editor.

8. Paste the screenshot clipboard contents into IrfanView by clicking **Edit|Paste** or use the keyboard shortcut, **Ctrl+V**. The results look like the following figure.

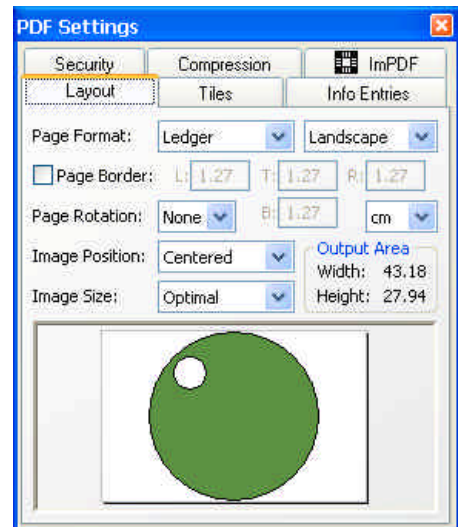
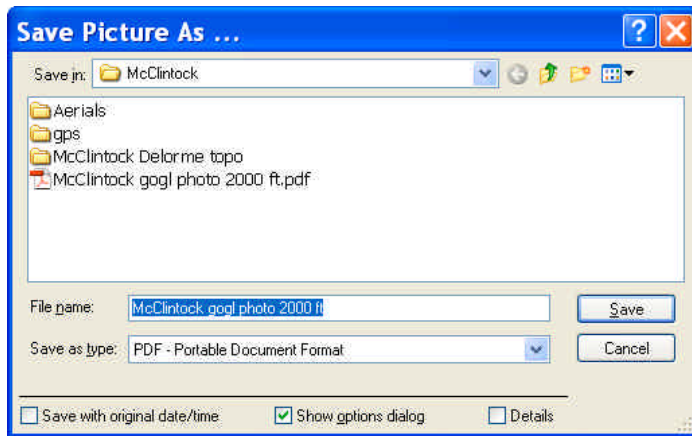


IrfanView photo editor with web map screenshot pasted in from Windows clipboard. Maximize the map you intend to print by cropping away the non-map portions of the screenshot.

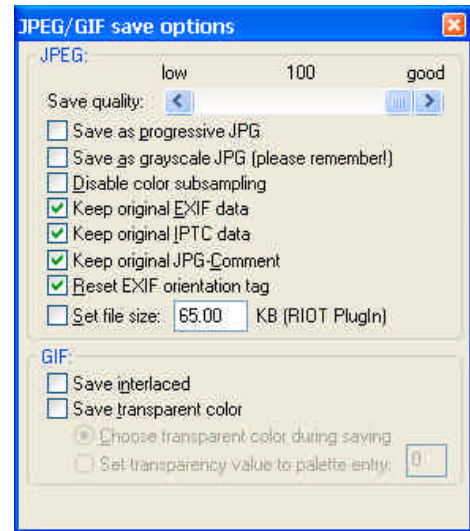
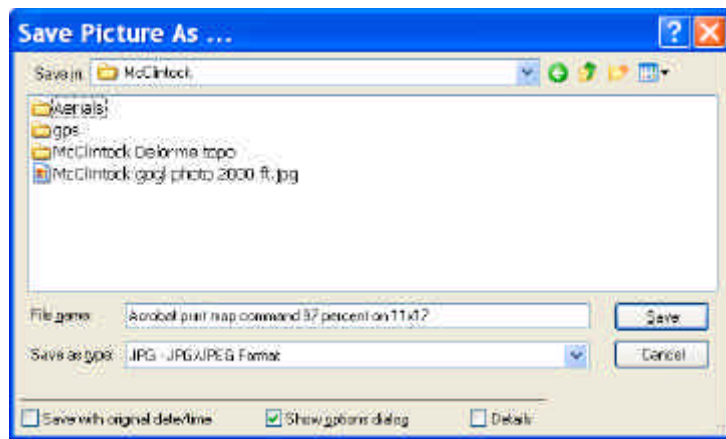
9. Drag with the mouse to create a rubber-band box to crop out the web page content. (If you are in a hurry, you can print without cropping, but cropping will maximize your final map image.) Fine tune your crop by dragging each of the crop box sides to the precise edge of the area you want to include. When the crop box is positioned where you want it, click **Edit|Crop selection**. Now you have a pretty clean map, as shown below. (For complete instructions on how to operate IrfanView, just click on the program's Help menu.)



10. Save the cropped map as a JPEG photo or PDF document. The PDF format is ideal for viewing and printing. The following screenshots show some Save As settings to experiment with when you make your own maps.

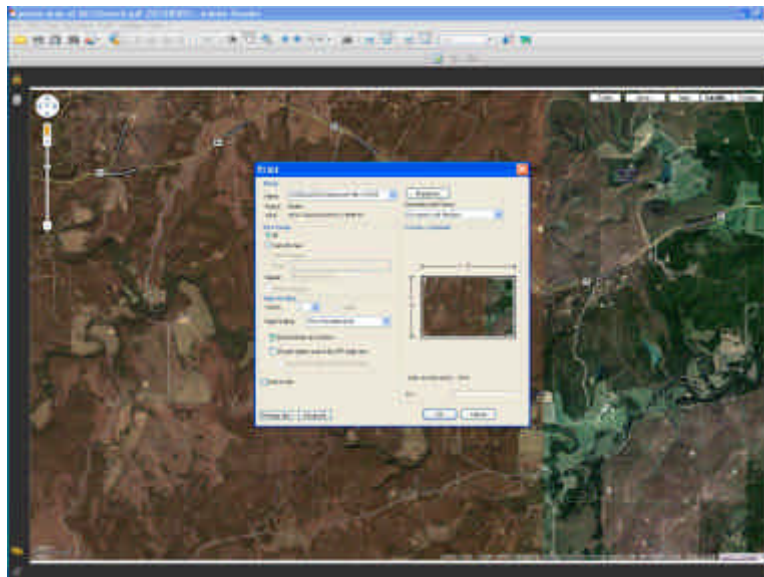


PDF save settings for a Ledger print size (11"x17") map. You can use other paper sizes like Letter and Legal.



JPEG photo save settings.

11. Here is the final PDF map, displayed in Adobe Acrobat Reader, ready to print on 11x17" paper. If your printed map is too dark or too light, you can edit it in IrfanView until you get the best quality print from your printer.



Of course, you can get more detail of a smaller area than shown above. Just go back to step 5 and zoom in a little closer, then take the screen shot. When I want to show Scouts where we will be camping, I will often take a series of screenshots, starting with a wide view and then zooming in closer. I like the aerial or satellite photos, because this accurately shows forest patterns.

### Other Map Sources

The technique we have just described also works for taking a screenshot of an enlarged portion of an official USGS geoPDF topographical map. Whether you are making paper maps or just looking up the latitude and longitude position coordinates of a landscape feature, a geoPDF is one of the most powerful tools available to Scout leaders.

Complete instructions for downloading free geoPDF topos and the free TerraGo Desktop (formerly known as the geoPDF toolbar) are available on the US Geological Survey map store web site: <http://store.usgs.gov>. The TerraGo desktop adds a great mapping toolbar to Adobe's free Acrobat Reader. When you get to the USGS store web page, look for the link on the right side of the page for

Topo Maps, where it says Download Topo Maps Free. When you get to that page, follow the instructions on the right side of the page, and download the 7.5 minute quadrangle maps. This will give you the classic 1:24,000 scale topo maps used by backpackers all over the United States.

### **Commercial Map Solutions**

You can also buy USGS paper maps from your favorite map vendor or order them from the USGS web store. But there are places where your camping or hiking area is right on the border of two or more USGS 7.5 minute quad maps. You can get around that problem by ordering a customized, printed topo map from myTopo (<http://www.mytopo.com>).

Montana-based myTopo is a tremendous source of affordable printed maps, online maps and mapping software. myTopo can print and quickly ship you the same scaled USGS topo detail, but they can center the map over your area of interest. So, instead of buying two to four official quad maps to cover your trek, you may be able to buy just one map, with prices starting at about \$10.

Individual map prints are their bread and butter. The printing quality is excellent, and with the toll free phone number myTopo also makes an excellent map source for people with limited computer skills. If you're comfortable with computers, you can subscribe to myTopo tools that allow a year's unlimited browsing, downloading and printing of custom maps for about \$30. Both photo and topo maps are available in different sizes, and different paper and folding options are available.

If you're handy with computers, you may prefer to purchase some mapping software so you can make and manipulate your own unlimited supply of paper maps without going on-line. One program we've used effectively is Delorme's [Topo USA](#).

Typically programs like this come on a DVD or set of multiple CDs. You can control the scale of your map and the size paper it will be printed on. Unlike our digital screenshot tutorial described earlier in this paper, Topo USA lets you make accurate, true-to-scale maps on a home printer that are suited for map and compass navigation.

We used Delorme Topo USA home-printed maps when we last took our troop on a 50-mile high adventure canoe trip in Minnesota's Boundary Waters Wilderness. An adult leader in each canoe group was equipped with a water-proof commercial map, and several leaders also had a GPS. Other canoes in each group were equipped with Delorme maps packed in plastic bags.

With the growth of hobbies such as geocaching (a GPS-driven scavenger hunt) and continued advances in GPS technology, the Internet has exploded with all sorts of free or commercial mapping tools and resources. We don't have space here to describe them all. For Oklahoma Scouters, we could get into another discussion on how to use the Oklahoma Department of Wildlife Conservation Digital Atlas. You can go to your favorite web search engine and look around for these topics, or visit our Troop 930 web site for a smaller group of links to some of our favorite resources (including the ODWC atlas above). Go to <http://home.valornet.com/leefamily/T930.htm> and look for the Links page. At the top of the Links page, click the Mapping/GPS/River Levels link to take you to that section.

With all the mapping resources available to Scout leaders today, it's easier than ever before to secure useful paper maps for your Scout adventures.

### **About the author**

Mark Lee is a founding committee member and the webmaster with BSA Troop 930, Broken Arrow, Oklahoma. He is a former technical publications manager for GPS maker [Lowrance Electronics](#).