

Section One Getting Started

Chapter 1 Making Your Own Maps

It's hard to believe my initial resistance to getting a global positioning system (GPS) receiver. After all, I thoroughly enjoyed paper maps, and I rarely used a compass. Instead, I was fascinated with reading the land. It felt great to take a topographic map and translate what I saw on paper into the landscape before me. I felt a kind of snobbery toward the techies who relied on GPS, imagining they would get lost if their batteries died. Don't get me wrong; I was no Luddite—not at work, where I knew as much as anyone about computers, nor at home, where computers and high-tech toys seemed to appear faster than our checkbook could handle them.

My anti-GPS bias changed one Christmas when I traveled east to visit family. My nephew gave his wife a GPS, though I think he was the one who really wanted it. I love the outdoors, so when they asked, “Want to go geocaching?” they didn't have to ask twice. After that trip, I was hooked on GPS. My wife, who is also my outdoor adventure partner, had just as much fun.

I then bought a fairly basic GPS, a Garmin Etrex Venture. Deciding which GPS to buy wasn't difficult. But figuring out if and how I could connect it to my computer was another matter. The GPS came with a cable for this purpose, but the documentation didn't specify what kind of software I would need. Buying the GPS was costly enough, and since I couldn't afford an expensive software package right away, I made do with shareware. The first shareware I tried was USAPhotoMaps, which offered GPS interface capabilities and free topographical maps and aerial photos of the entire United States. When I wanted to do more waypoint and route management, I downloaded EasyGPS. Both of these free software packages are covered in subsequent chapters.

The first big trip my wife and I took with our new GPS was to Utah's San Rafael Swell, a maze of slot canyons that, though portions were proposed as a national park in the mid-1930s, remains unprotected and in the hands of the Bureau of Land Management. The trip was pretty much a washout: The threat of rain kept us out of the canyons for the most part, and gale-force winds sandblasted us with red rock dust. We did manage to get in a technical descent of Music Canyon and a nice mountain bike ride before being driven from the desert. During our exit up Music Canyon, my wife commandeered the GPS to keep watch on our position, upcoming landmarks, and our estimated time of return. It seemed we had both caught the GPS bug.

Back home, I was ready to put the GPS to use on our weekly mountain bike rides. I wanted software that included maps of our area, but was once again confronted with a confusing array of choices: Would it have to be Garmin software since that was my GPS brand? What could I do with the software once I bought it?

I ultimately decided to go with National Geographic's TOPO!, spending \$100 for the software for our state. I immediately started having fun with it, using it to guide us to locations and, when we returned, overlaying onto a map the GPS's "track" showing where we'd been. It was a real kick the first time I was able to pinpoint a trail location more accurately than the U.S. Geological Survey!

Before long, I had graduated to more sophisticated software. I live near extensive timberlands. Some of the corporations that own the land tacitly allow public access to hundreds of miles of old logging roads, which makes for ideal mountain biking. Soon I was using various electronic and paper sources to transfer roads to my maps, creating a highly accurate base map for our area. I even managed to add land ownership boundaries, first sketching them into TOPO! and later transferring them to other programs from geographic information system (GIS) data I found online.

Before long I was downloading free USGS maps and aerial photos. This kept me from having to pay for another set of state CDs for our next trip to Utah. I could also use recent aerial photos to find and place roads that weren't on maps. I could even generate 3-D images from topographic maps and aerial photos. I was having a blast.

Why Use Mapping Software?

It's fun to create your own maps to use with your GPS—but there are also plenty of practical reasons to do so.

Improved waypoint and route management top the list of reasons for making your own maps. Keying waypoint coordinates into the tiny screen on your GPS is a pain in the rear, and it's fraught with opportunities for error. Typing them into your computer is much easier and faster. Often you can bypass this step entirely by simply clicking on the map where you want to establish a waypoint.

Another reason for creating your own maps is that many GPS units limit you to 500 waypoints. What happens when you exceed that number? With most mapping software, this is no longer a problem. The extra waypoints are stored on your computer until you need them. There you can easily organize them, creating files for your favorite river basin or for that upcoming vacation.

Route management is another task that mapping software makes easy. Instead of having to use your GPS's onscreen keyboard or scroll through a long list of waypoints, you just click a waypoint on a map or drag and drop a waypoint into a list. What is painful

with your GPS becomes a breeze on your computer. Waypoint and route management are covered in more detail in the chapters on specific software and in Chapter 6.

With the exception of mouse-type GPS units made to connect to PDAs, all handheld GPS units record tracks, those breadcrumb-like trails that mark where you have traveled. Although they have some use in the field, allowing your GPS to direct you back over the route you took, these tracks become powerful tools when downloaded from your GPS to your PC. Perhaps the road you jogged today isn't even on a USGS map (they're updated only every twenty years or so). Download your track from your GPS when you get home and you instantly have a current map, along with a record of your trip. Want to see how many miles you covered or how much elevation you gained? Find out quickly and easily when you connect your GPS to a computer.

Almost all of the programs discussed in this book support the two-way transfer of waypoints, routes, and tracks between your GPS and computer. They're great aids for trip planning and map preparation, and for creating records and analyzing trips after you return.

Deciding What Type of Software You Need

It would be nice if cost and features were the only things to consider when deciding which mapping software to use. Unfortunately, this is not the case.

Some of the more user-friendly mapping packages provide you with all the USGS 1:24,000-scale topographical maps for your state or region for around \$100. Other software lets you download those same maps for free. The key word here is "download." If you have broadband, such programs—which include everything from the simple and straightforward USAPhotoMaps to the more complex and complete OziExplorer—can be an attractive option. Though they can be used with dialup connections, downloads take much more time.

Many users who don't have broadband access turn to maps on CD. If you want simplicity, rarely travel far, and don't mind spending \$100, a package that includes all the maps for your state may be an excellent choice.

Another factor to consider is moving maps. Do you want to be able to track your position in real time with a laptop or personal digital assistant (PDA)? While it won't really help you on the trail (without a Sherpa toting a lot of extra batteries), it may help you find that isolated trailhead on a poorly marked national forest road—not to mention that cool Vietnamese restaurant in the city. And speaking of cool, there's nothing like having your PDA or laptop audibly tell you where and when to turn. Programs with moving-map capabilities are discussed in the individual software chapters, and PDA-based programs are covered in Chapter 22.

Table 1. Feature comparison chart. Please note that some features not present in the tested version are planned for upcoming releases. See specific software chapters for details.

	Cost	Demo	Entire US	3-D	Aerial Photos	Moving Map	PDA Module ^d	Printing	Shape File Import
USA PhotoMaps	Free	Yes	Yes	No	Yes	Yes	No	Minimal	No
National Geographic TOPOI	\$99.95 ^a	No	No	Yes ^e	No	Yes	Yes	Yes	No
Terrain Navigator	\$99.95 ^a	Yes	No	Yes	No	Yes	Yes	Yes	No
Terrain Navigator Pro	\$299.95 ^a	Yes	No	Yes	\$ ^c	Yes	Yes	Yes	No
3-D Topo Quads	\$99.95 ^a	No	No	Yes	\$(satellite) ^c	Yes	Yes	Yes	No
Topo USA	\$99.95	No	Yes	Yes	\$ ^c	Yes	Yes	Yes	No
TopoFusion	\$40.00	Yes	Yes	Yes	Yes	Yes	No	No	No
Expert GPS	\$59.95	Yes	Yes	No	Yes	Yes	No	Yes	No
OziExplorer	\$85.00	Yes	Downloadb	Yes	Downloadb	Yes	Yes	Yes	Yes
Fugawi	\$99.00	Yes	Downloadb	No	Downloadb	Yes	Yes	Yes	No
Garmin MapSource	\$116.65	No	Yes	No	No	Yes	Yes	Yes	No
Magellan MapSend	\$149.99	No	Yes	No	No	Yes	No	Yes	No
Lowrance MapCreate	\$99.95	No	Yes	No	No	No	No	Yes	No

a – These costs are per state or region. Some packages are available at lower cost for limited areas, such as when several national parks are grouped together.

b – Maps and aerial photos must be downloaded online, typically for free. They can also be purchased on CD.

c – Aerial photos are available at extra cost. There is no charge with Terrain Navigator Pro until year two.

d – Costs and capabilities in this area vary dramatically. Refer to Chapter 22 for more information.

e – An expansion pack is required, at a cost of \$199.95.

Finally, how much fun do you want to have on rainy days when you aren't in the backcountry? Some software programs offer 3-D capabilities that, when combined with aerial photos, offer the next best thing to actually being there. And don't get hung up on making a single choice. Until the perfect software comes along, you may find that a combination of several programs best serves your needs. Table 1 offers a comparison of features, but don't rely on it alone. As they say, the devil is in the details. A program may have a feature you want, but that doesn't mean it's simple and intuitive.

In summary: A GPS alone is nice, but a GPS in combination with a desktop computer and free or low-cost mapping software extends your capabilities dramatically. You may never need to buy a map again.

Using This Book

You are about to embark on a grand adventure. On this journey you'll learn about mapping software that lets you locate waypoints before a trip and generate maps to help you pinpoint your location in the field. And when you come back home, you'll be able to download all the information you collected and see the actual route you took. The chapters ahead will focus on what you can do with your GPS and computer. If you need more basic information on how to use your GPS, take a look at the books listed in the bibliography. This book, unlike those listed in the bibliography, assumes you have a working knowledge of using waypoints, routes, and tracks. Even so, most people who have just purchased a GPS will find a wealth of useful information here.

Even though many of the software packages discussed here focus on the U.S., readers of other nations will also find useful information. International mapping enthusiasts frequently turn to OziExplorer and Fugawi, the subjects of Section Four, which accept a wide range of map file formats from around the globe. You can also construct maps for other countries from GIS files, as discussed in Chapter 23, and create international maps for your GPS, using the methods found in Chapter 24.

Another thing to keep in mind: This book focuses on PC applications, simply because there are so many PC-based mapping programs on the market and so few for the Macintosh. There is, however, a brief section on mapping resources for Mac users at the end of Chapter 3.

In addition, as GPS technology becomes more commonplace, all sorts of uses and models have been showing up in the marketplace. Marine GPS units, dedicated automotive navigation devices, and the like are beyond the scope of this book.

Finally, please note that all prices and descriptions listed here are as of the time of printing; please check company Web sites for any changes.

Following a few introductory chapters, we'll look at several free mapping and waypoint-management software packages that are so useful they should be in almost everyone's mapping arsenal. These are discussed in Chapters 5 and 6. The next section of the book, Maps on CDs, deals with user-friendly consumer software that, in general, covers a single state or region. Section Three, Downloading Maps: More Microsoft TerraServer-Based Programs, investigates two programs that allow you to download maps and aerial photos for the entire United States. Section Four, Downloading Maps: Free Maps from USGS and Other Sources, delves into a more involved process that gives you access to powerful mapmaking tools. Section Five, GPS-Based Maps, looks at the latest generation of handheld mapping tools that put detailed topographic maps on your GPS screen. Finally, Section Six, Power Mapping, explores aerial photos, satellite imagery, 3-D applications, Palm- and Pocket PC-based moving maps, geographic information systems (GIS), making your own GPS-based maps, and moving data between programs.

Like most readers, you may be more interested in some chapters than others. But I encourage you to carefully read the introductory remarks at the start of each section. Even if you'll primarily use a single mapping program, the tools covered elsewhere may be of interest.

The software chapters provide the following information:

- **Basic Information.** This covers software costs, system requirements, GPS compatibility, contact information, additional options that may be available, and Internet resources such as online discussion groups focused on a particular brand of software.
- **Advantages and Disadvantages.** This covers unique features found in each program, or common features missing from it, that make it stand out from the competition. Many features common to a software group are covered in the introduction to each section, so don't rely solely on the advantages and disadvantages discussed in the individual chapters.

Remember, most of the software in this book is updated frequently, and any disadvantages are sure to be on the radar screen of the designers. Be sure to check the software companies' Web sites for information about new releases and upgrades before basing a purchase decision on any information you read here.

- **Tutorial/Manual.** This section lets you know if the software you're considering includes a tutorial, where to find the help files, and just how useful those components are.
- **Installation and Configuration.** Here you will learn where to change coordinate formats, set up your brand of GPS, and, in some cases, do much more.
- **Getting Started.** Here's where the fun begins. You'll learn how to move around a map and zoom in and out.

- **File Structure.** As you get more involved with computerized mapping, you'll probably want to know where the software stores information on your computer. You'll find that information here, along with tips for organizing map data.
- **Waypoints and Waypoint Management, Routes, and Tracks.** Here you will learn each program's unique way of placing, editing, and managing these critical items.
- **Printing.** These pages give you tips and tricks for creating the most useful field maps.
- **Moving Map.** Here we explore the capabilities of programs that provide real-time location tracking on a laptop. Similar PDA-based applications are covered in Chapter 22.
- **3-D.** Where a program offers 3-D capabilities, these features are discussed in detail. Look for more information on 3-D in Chapter 21.
- **Working With Other Programs.** This is where you can learn how to import and export data such as waypoint files.
- **More Tips.** Here you'll find tips and tricks that will make you a power user.

The order of some of these items may vary, depending upon the design of the application discussed.

Finally, be sure to visit www.MakeYourOwnMaps.com regularly, for updates to the information presented in this book.

Disclaimer!

Computers and people are both fragile and prone to damage. Use good sense when you're out in the wilderness and when you make changes to your computer. I wish both you and your computer a long and healthy life!

Updates to this book will be posted at www.MakeYourOwnMaps.com. Bookmark and visit often to see what's new in the world of digital mapping.