The Forestry Source
News for forest resource professionals published by the Society of American Foresters

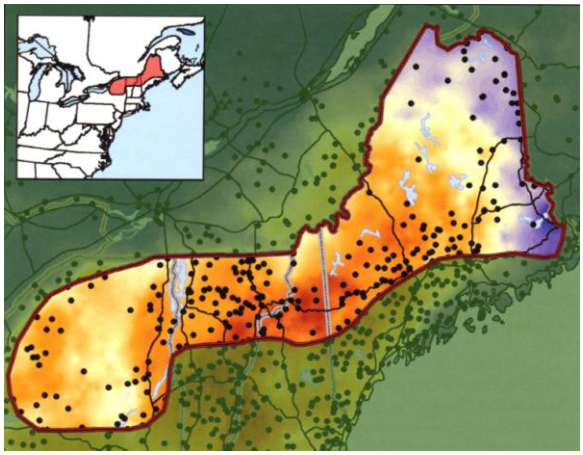
Field Tech: ESRI's *Mapping Forestry* Book is Worth a Read

By Steve Wilent

GIS, GPS, laser rangefinders, handheld field computers that fit in your shirt pocket. Sometimes we forget that these tools are fairly recent innovations (well, at least to me and other people of a certain age). Environmental Systems Research Institute Inc., or ESRI, maker of ArcGIS family of GIS tools, held its first user conference in 1981. Sixteen people showed up. Arc/Info, released in 1982, was the company's first commercial GIS software. It ran on "minicomputers" the size of washing machines. A version of Arc/Info for personal computers was released in 1986; PCs themselves had been available for just five years. When ArcView debuted in 1992, users eager for this desktop-computer mapping software bought 10,000 copies in the first six months. ESRI's international user conference in last year drew more than 12,000 people, down from about 14,000 in 2008. ESRI plans to release ArcGIS Desktop version 10 later this year.

In the nearly 30 years since the advent of Arc/Info, GIS has become an integral part of forest and natural-resource management. "GIS technology has had a profound impact on the way foresters manage the timber resource," writes Peter Eredics in the introduction to *Mapping Forestry*, a new book published by ESRI. "Initially embraced to maintain more accurate timber inventories, GIS is evolving to become the foundation for new decision-support tools used in all areas of integrated forest management."

Eredics, the book's editor, is a forester who manages ESRI's global forest-products industry business development and marketing group.



This map from *Mapping Forestry*, created by Nate Anderson, Eddie Bevilacqua, and René Germain, shows sawmills in the Northern Forest region of Maine, New Hampshire, Vermont, and New York. Colors indicate woodshed overlap; dark-red areas include more than 30 mills, while blue or dark blue areas contain fewer than 10. Source: *Mapping Forestry*, ESRI Press, 2009

Mapping Forestry presents descriptions of how GIS has been employed in 19 real-world situations. Each of 19 chapters is written by the forestry or GIS professionals who used ESRI products to meet specific resource-management challenges in North America and other countries such as Brazil and Finland. The chapters are arranged in four sections: mapping for business, inventory, operations, and sustainability. The authors describe the geography-related questions they sought to answer, provide full-color maps, and summarize the data dictionary, software tools, and other resources they used to create them.

Aside from the maps themselves, each chapter includes a "Recipe for map building success" section that describes the key steps in the process.

Chapter 2, for example, is entitled "Imports and exports of roundwood in the upper midwestern United States." Authors Charles H. (Hobie) Perry, Mark D. Nelson, and Ronald J. Piva, offer a map that illustrates roundwood imports and exports amongst the 10 states in the region, as well as surrounding states and Canada. Based on this analysis, the authors show that Michigan, Minnesota, and Wisconsin have the most timber flow, and identify Indiana as the most diverse importer.

The authors describe seven steps in the recipe for map building success:

1. Develop and refine your question
2. Identify the audience
3. Decide if a map is the best communication tool
4. Acquire, understand, and prepared tabular data
5. Create new spatial files
6. Summarize the data
7. Prepare the map

These steps may sound generic, but the authors briefly explain each in the context of their specific project. Developing and refining the question was, naturally, critical: "Our original question was, what is the pattern of log movement from harvest sites to mills across the United States?" The authors write. "A review of the available data make clear that this question is too complex to address in a small-format map. We refined our question to generalize our unit of interest to the state level, thereby simplifying the data by summarizing it at a coarser scale. We then restricted our field of interest to the Midwest, balancing the desire for detail with the constraints of the demonstrated map format."

In Chapter 13, "Improving watershed health and air quality in Washington, D.C.," Holli Howard and Mike Alonso offer this recipe:

1. Compile existing data from the District of Columbia, geographic information system.
2. Process IKONOS satellite imagery.
3. Identify priority planting areas
4. Plant trees and collect data
5. Determine map colors and symbols

Their map has proved useful in highlighting sites for planting trees to strategically combat environmental problems such as urban heat islands, poor air quality, and sewer system overflows.

The maps, lists of data and tools, and recipes are useful as roadmaps that show how the authors used GIS in innovative ways, and readers are likely to look at their own projects and new ways, based on the insights presented in the book.

Some readers may desire more technical detail than is given. For instance, in Chapter 17, "Prioritizing restoration in fire-adapted forest ecosystems," Chris Zanger and Amy Waltz discuss their use of ESRI's ModelBuilder and Spatial Analyst, as well as the US government's Fire Regime Condition Class tool (public-domain software available from www.frcc.gov), to create a map that identifies restoration priorities in the Upper Deschutes Basin in Central Oregon. I can imagine that some readers would be interested in a discussion of the specific steps the authors used in ModelBuilder and Spatial Analyst, interaction between these tools and FRCC, and the strengths and weaknesses of these tools in accomplishing the goals of the project.

On the other hand, adding such detail would surely result in a far longer and more costly book. As it is, Eredics has packed a wealth of information into just 88 pages, and the retail price of $39.95 is quite reasonable. Intrepid readers seeking additional information will find contact information for the authors listed on the last few pages of the book.

If you are a GIS user looking to expand your technological horizons, or are simply interested in how the technology is used in forestry settings, I recommend adding this book to your personal library.

Mapping Forestry (ISBN: 9781589482098) is available from online booksellers and from ESRI Press, 1-800-447-9778, www.esri.com/esripress.

Wilent is Editor of The Forestry Source.