of another color, resulting in an additive color. This is not desired at times. Note the color created where the black overprints the yellow in the upper left portion of Figure 1. Even when using a customer's application trapping setting, the printer may choose to globally overprint black automatically. You can anticipate this, and compensate by tricking the printers software by making your blacks that must not overprinted 100-k 1-c 1-m 1-y. Make heavy solid black areas 100-k 40-c for a deep rich black. Trap these as a normal color. Knockout-one color 'knocks out' the color underneath, but a trap is required.

Sometimes projects require special trapping regimes in order to be properly executed. If the cartographer has a full understanding of trapping, manually trapping in the applications can give desired results better than automatic trapping, but it will be time-consuming.

CONCLUSIONS

Knowledge is the key to working successfully with printers and prepress departments. This article has hopefully shown some of the common practices and best methods for cartographers to use when working with a printer to publish a map. However, this article is really the tip of the proverbial iceberg. Map makers should educate themselves prior to designing their map and especially prior to visiting their printer. Check out trade publications that publish techniques such as *The Journal of Electronic Publishing*, *American Printer* magazine, *High Volume Printing*, *Graphic Arts Monthly*, and *Newspapers and Technology*. For working successfully in color managed environments consult reference books such as the GATF Practical Guide to Color Managment and Understanding Color Management by Abhay Sharma. There are also online groups such as colortheory@yahoogroups.com and colorsync-users-request@lists.apple.com.

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map library bulletin board

Penn State University Libraries: Building a Literary Map for the Web

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In late summer 2000, Dr. Steven Herb, the Penn State Education Librarian and Director of the Pennsylvania Center for the Book, asked if the Maps Library would collaborate on a mapping project. Dr. Herb wanted to provide the Pennsylvania citizenry, the schools, and public libraries with access to information about Pennsylvania authors and their books in the form of a Web-based interactive map with an integrated biographical database. In other words, he wanted to design an on-line literary map. Intrigued, I agreed to assign the Maps Library's GIS support staff member, Derrick Beckner, to design the base map.

The original *Literary Map of Pennsylvania* was published by the Pennsylvania Council of Teachers of English in 1959, and revised in 1965. After nearly 40 years, Dr. Herb felt that Pennsylvania's many noted authors deserved a revised map with more authors and a greater depth of information, and he believed that the online environment was capable of delivering a much improved product.

The decision to develop an online map instead of another paper revision was both cultural and financial. The Web is where exciting things happen these days and, being practical, it avoids printing, storage, and shipping costs in the delivery of the product to the user. While the development costs of Web products are substantial, the Web also permits the use of animation, color is no more ex-pensive than black and white, and more information can be attached to online maps than can be printed on traditional paper maps. Thus, for a non-profit group or institution, the Web provides a way to transfer information to their constituents relatively economically and efficiently.

The Pennsylvania Center for the Book has a very small part-time staff, so developing the online *Literary Map of Pennsylvania* has been a cooperative venture. Sixty people at the University Park campus (5 part-time paid workers, 5 part-time interns, 8 Journalism interns, 1 Independent Studies student, 40 English students, 1 Maps Library staff member, 2 Public Relations staff members, and 1 computer technician) as well as public librarians and county historians from each of the sixty-seven counties have provided support during the development period.

In designing the literary map, Derrick Beckner used *Adobe Il-*

lustrator, Photoshop, ArcView 3.2, USGS Digital Elevation Models (DEM), and the royalty-free data set, *MapArt USA*. Karen Schwentner, the Web developer, used *Flash 5* and *ColdFusion MX* to integrate the map and the biographical database. Macromedia's *Flash* animation software was chosen as the main interface because of its ability to deliver both raster and vector images efficiently, because it dramatically reduced the amount of time spent in design and production and it is supported by both *Internet Explorer* and *Netscape. Flash* uses its own scripting language, *ActionScript*, which is similar to *JavaScript*, to dynamically integrate with Web applications.

The state-level map was developed from a stock vector map from *Map Art Deluxe-USA*. Adobe *Illustrator* was then used to modify the map's color scheme and create the heavy, county borders. The thumbnail images were optimized with *Photoshop* and then imported into *Flash*, along with the map. It took considerable time and effort to reduce sixty-seven (67) polygons, seventy plus (70+) images, and a considerable amount of text into a page of reasonable size. File size was an important issue with this project since the site is aimed towards classroom use and the general public with the expectation that neither group is likely to have access to high-speed internet connections.

The state-level maps with highlighted county boundaries were created in a similar manner, except the base maps were created from several data sources in *ArcView* before being imported into *Illustrator*. For aesthetic and educational reasons, literary information as well as geographic information were placed on a physical relief base. The down side to this decision was that it necessitated large file sizes with most of the pages being 150-200K. File size optimization was a major challenge and it is hoped that the size of each map will be reduced to less than 100K in time for public release to enable faster loading.

The individual county maps are a combination of aerial photographs overlaid with hand-drawn, somewhat arbitrary, neighborhoods. Otherwise they were created in an identical manner to the previously mentioned maps.

This project is entering its fifth year and it is not yet completed, although it is available for public use with limited access to the biographical data. Although it is not unusual for cooperative projects supported by part-time staff to take more time than originally planned, in this case it has been the literary research that has slowed the project.

While it was clear from the beginning that the literary database was the larger part of the project, collecting this material has been more time consuming than anticipated. This has been due to the decision that each of the counties should have literary representation and each author's entry should contain a consistent amount of information. Unfortunately, authors don't choose to distribute themselves evenly across a state, they cluster, and finding standard information on all the authors, including copyright-free photographs or portraits, has been difficult as well as occasionally impossible.

Organizing the work flow or production process for a project that is dependent upon part-time or volunteer labor is not always easy, even when there is agreement that adjustments would be helpful. Derrick Beckner, the map designer, felt that he would have preferred to have all the data provided at one time rather than delivered to him piecemeal. He felt the intermittent work schedule of periods of heavy workloads under short deadlines followed by long lulls was not efficient and collecting the data before commencing the technical work on the map might improve the overall process. He also felt that the work flow improved once Karen Schwentner, the Web designer, learned *Flash.* Forming a partnership, they divided the workload: she handled the graphics and coding work on the pages while he supplied the maps.

Ms. Schwentner noted that the potential obstacles of using Web applications are cost, accessibility, and the level of knowledge required to use the software. At the time of development, without an educational discount, the cost of purchasing *ColdFusion MX Server* was roughly $5000 with an additional $900 for the suite of software containing *Flash* and *ColdFusion Studio,* for html and cfml development.

An additional Web design focus was on integrating a means of accessibility to the page for the visually impaired. For those users *alt tags* provide textual descriptions of images that are read aloud by a text reader. At this time however, *Flash* does not provide a means to display alternative text, therefore visually impaired users cannot experience a text alternative within the *Flash* version of the *Literary Map of Pennsylvania* and must rely on a text-only version of the site in strictly html form.

Finally, knowledge of multiple software programs, in this case *Flash, ColdFusion,* an image editing program, and basic html, as well as how to integrate them, is needed to successfully complete a literary map.

Well-designed literary maps are one of the most interesting and imaginative types of maps on the market and placing them on the Internet will increase their accessibility and make them even more attractive to a new generation of users. Although it takes determination, a clear vision, and a great

deal of effort by a collection of talented and dedicated people to produce an on-line literary map it is well worth the effort.

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reviews

Connecting Our World: GIS Web Services
By Winnie Tang and Jan Selwood.
Redlands: ESRI Press, 2003.
164 pages, numerous color illustrations.
Soft cover, 7.5 by 9 inch format.
ISBN 1-58948-075-9

Reviewed by David Broscoe,
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This volume continues ESRI Press tradition of publishing well-produced, relatively inexpensive books on various facets of GIS. Most of the press's other books have focused on a given application area (GIS and Business, GIS and Emergency Services, GIS and …). *Connecting Our World*, narrowly targeted at managers, describes how web technology can be used in a number of different application areas by a range of organizations to serve GIS data to the web. The narrow target audience limits its appeal to others in the field, and narrowly determines the range of material covered in the book. I will first summarize the book content and then undertake an overall critique.

The introductory chapter discusses the concept of WebGIS, outlines some of the potential advantages to an organization in using a WebGIS approach, and very generally discusses the required technology and the de facto standards that have been developed.

Each one of the next twelve chapters outlines one particular application of WebGIS. The first chapter discusses the Geography Network, a 'metadata search-and-discovery framework that permits exploration of distributed spatial data sets and services' (p 11), launched by ESRI in 2000. The chapter describes the use of Geography Network architecture to implement specific gateways (Kentucky's Geography Network, Delaware's Data Mapping and Integration Laboratory and the United Nations Environment Network). In each case the software (inevitably including at least one ESRI product) and hardware implementation is described. The (mostly) implicit tie between the book and ESRI products and services will be discussed later.

Chapter two examines a national implementation, New Zealand's TopoOnline, which provides users with web access to a full range of online topo map series. One generic technical issue explained in some detail is the conversion from a local geodetic datum to a geocentric geodetic datum compatible with WGS84 and therefore with GPS.

While many large organizations choose to implement and maintain their own web servers, many smaller organizations elect to contract out these services. Chapter three describes three such implementations, one involving the Crown Estate, the agency responsible for managing the estates of the British Crown, and two involving local government applications.

While the geographic data in the implementations discussed in previous chapters may be browsed by anyone with a web connection and a browser, many enterprise-wide WebGIS implementations are designed to limit access to those who work within an organization. The 'Native Title View' of the LandLinks service of the Department of Land Administration, Western Australia, is one such application described in chapter four.

Three approaches to property management are described in