

(lead) into meaningful information (gold). Sift it, scrub it, purify it, and live off the nuggets of pure gold that your competitors would dearly love to have.

We now experience the need to adorn our databases with nontextual information just as the monks felt the need to "illuminate" books. Perhaps, what Pope Gregory the Great said of book illumination is true of the Web, "Painting can do for the illiterate what writing can do for those who can read." In the carrels of the scriptoria the monks worked, stopping only to complain "with two fingers I toil." An eerie parallel to the modern Internet worker, working in one of the cubicles pictured in Dilbert, mindful of carpal tunnel syndrome. You may wonder, however, whether the Web will ever host as enduring a work as the Book of Kells. If the Book of Kells is never produced, it

will not be through want of effort for the young programmer with his mantra, "When I am not sleeping I am working" has a regimen more intense than the Benedictine monk with his prescribed life of one third prayer, one third sleep, and one third intellectual and manual labor.

#### Notes

- 1 Tim Ouellette, "Human Services Get Tech Boost," *Computerworld*, December 29/January 5, 1998.
- 2 Laura DiDio, "NT Server doesn't Come Cheap," *Computerworld*, October 20, 1997, p. 1.
- 3 IBM, "Object-Relational DB2", <www.ibm.com> September 1996, p. 10.

*John P. Byrne is National Register Database Manager National Park Service. This speech was given at the Information Ecosystem Conference.*

---

Carol D. Shull

## Computerizing the National Register of Historic Places

---

**A**nyone anywhere in the world with Internet access can find out what is listed in the National Register of Historic Places, our nation's official inventory of buildings, sites, districts, structures and objects significant in American history, architecture, archeology, engineering, and culture. Since 1986, the National Park Service (NPS) has had a computerized index, the National Register Information System (NRIS), which contains information on the nearly 80,000 historic places that are either listed in or determined eligible for the National Register. Now available on the Internet, this automated index has made expanding and maintaining the National Register more efficient and opened to the public a wealth of information about heritage resources for research, planning, policy analysis, public education, and tourism. The way that the NPS has gone about creating the NRIS and related initiatives and the lessons learned along the way may be of value to others in planning and carrying out computerization projects.

The NPS considered automating the National Register as early as 1968, soon after the passage of the National Historic Preservation Act. National Register and Advisory Council on Historic

Preservation staff worked with IBM to design the first nomination form. A report titled "An Information System for the National Register" was completed in 1969. Diane Miller, who formerly managed the NRIS, writes in her excellent summary of the history of efforts to computerize the National Register, published in *CRM*, that this prescient report stated that "only an automated file system can assure adequate storage, retrieval and presentation for the volume of entries (over 100,000) anticipated."<sup>1</sup>

The NPS actually began the development of a computerized index in 1974 and had an operational system by 1977. The bureaucratic disruptions caused by the transfer of the National Register program from the NPS to the newly created Heritage Conservation and Recreation Service (HCRS) in 1978 and its subsequent transfer back to the NPS when HCRS was abolished in 1981, and staff turnover resulted in the abandonment of that system and preparation of a revised functional requirements document in 1983. Data was reentered in the new system maintained on a Hewlett Packard minicomputer, and data entry in the NRIS of all listings up to that time was finally completed in 1986. **It is not uncommon for bureaucratic changes to negatively impact database planning**

**and development. This puts a great responsibility on managers to carefully examine the effects of their decisions to assure that valuable work is not lost.**

The NPS benefitted from preparing a detailed functional analysis to identify requirements and objectives of the proposed system prior to making final decisions. In planning the NRIS, we tried to select as few data elements as possible to provide an effective index to National Register properties and access to descriptions, statements of significance, bibliographical references, maps, and photographs on each property in the National Register files. Information management systems that collect a large number of data elements for numerous cultural resources can become too expensive to continue and maintain over time. The NRIS includes all 45 data elements for each of the over 68,000 listings in the National Register, any of which can be searched in combination, a manageable number that allows it to be used effectively for policy analysis, research, preservation planning, and public education.<sup>2</sup> **A cost benefit analysis is helpful to determine how important each proposed data element is, how often it is likely to be queried and for what purposes, and to determine whether the costs of collecting and entering data and maintaining the proposed database can be supported over time.**

To determine which data elements to collect, the National Park Service had an interdisciplinary team select draft data elements and then sought advice from a variety of users such as State Historic Preservation Offices, federal agencies, professional organizations, and individuals before making a final selection. Seeking input from users was very helpful in making decisions. Nominating authorities collect the information on National Register nomination forms from which data is entered into the NRIS, which also helps keep the NPS' costs down.

In the early 1980s when the data was being entered, the NPS hired graduate students and other trained professionals in preservation related disciplines to review the paper documentation on each property and key in the data. A system to monitor their work for accuracy was put in place, and subsequently nominating authorities have reviewed the NRIS for errors, which the National Register staff corrects as they are identified.

The National Register nomination and determination of eligibility processes were analyzed in preparing the functional analysis so that the NRIS could become integral to the processing of nominations and determinations of eligibility. Data is entered on new nominations and determination of eligibility requests as they are received. National Register staff all have access to the database at

their desks, so they can answer information requests quickly and efficiently.

Although all data entry is currently done by the National Register staff, the NPS has just completed the development of a Microsoft Access software package for completing the National Register nomination form that includes instructions for filling out the form and is downloadable from the National Register's Internet site. The data elements are automated as information is entered by private citizens and government officials filling out the computerized form. The completed forms can be sent to nominating authorities electronically or on a disk, and nominating authorities, or federal officials requesting determinations of eligibility as part of the planning of a federal project, can transmit the completed forms in the same way to reviewing agencies and the NPS for final processing. This software builds on the NRIS and is the first step in the direction of transmitting and processing nominations and determinations of eligibility electronically.

The software also makes it possible for federal, state, local and tribal government agencies with computerized cultural resource inventories to dump the computerized data elements into their own databases if they are compatible and the NPS' National Register staff to do the same without re-keying. **The NPS has been encouraging government agencies to incorporate the NRIS data elements as core data elements in their own cultural resources inventory databases so that cultural resources data can be made more accessible in a consistent manner nationwide.**

The categories of information on cultural resources collected on National Register registration forms have remained fairly consistent throughout the history of the program, and the National Register has made only conservative revisions to the forms over time.<sup>3</sup> The same categories of information are recorded on all resource types. **Organizations that do not collect data consistently for all resource types will be hampered in their efforts to automate.** Historic preservation programs that have used a variety of survey and inventory forms collecting different data may find it more difficult to enter consistent data elements on cultural resources into an automated system.

Some organizations have developed entirely different databases for archeological sites and other resources types. One of the most effective aspects of the NRIS is that consistent data is entered into one database that includes all cultural resource types. This is particularly important for property types that may have a variety of values, such as districts that contain resources of historic, architectural, and archeological significance. Having consistent data in one database makes it

possible to do comprehensive nationwide searches of National Register properties.

The National Register staff generally has resisted the urge to add new data elements that increase the costs and would not be available for all of the entries. Although the NRIS can serve as a guide to many subjects there are many categories of information it does not contain. To aid the researcher who wants to explore such subjects, **the National Register has an Internet site that permits downloading of the entire database for in-depth analysis.** Researchers then can add their own cross references on listed properties.<sup>4</sup> Database managers, who have not already done so, might consider doing something similar with their own automated systems to make them as useful to the public as possible.

The National Register requires properties to be located on U.S. Geological Survey maps, and the National Register form records universal transfer mercator (UTM) references from USGS maps on each property. Because UTM references are computerized, National Register properties can be mapped using Geographic Information Systems (GIS). **The ability to map properties using GIS technology has greatly enhanced the usefulness of National Register information for research and planning and made it possible for those developing GIS systems to incorporate information from the NRIS and integrate it with other environmental and geographic data.** As global positioning technologies continue to develop and are used increasingly to collect location information in cultural resources surveys, this data will become even more precise.

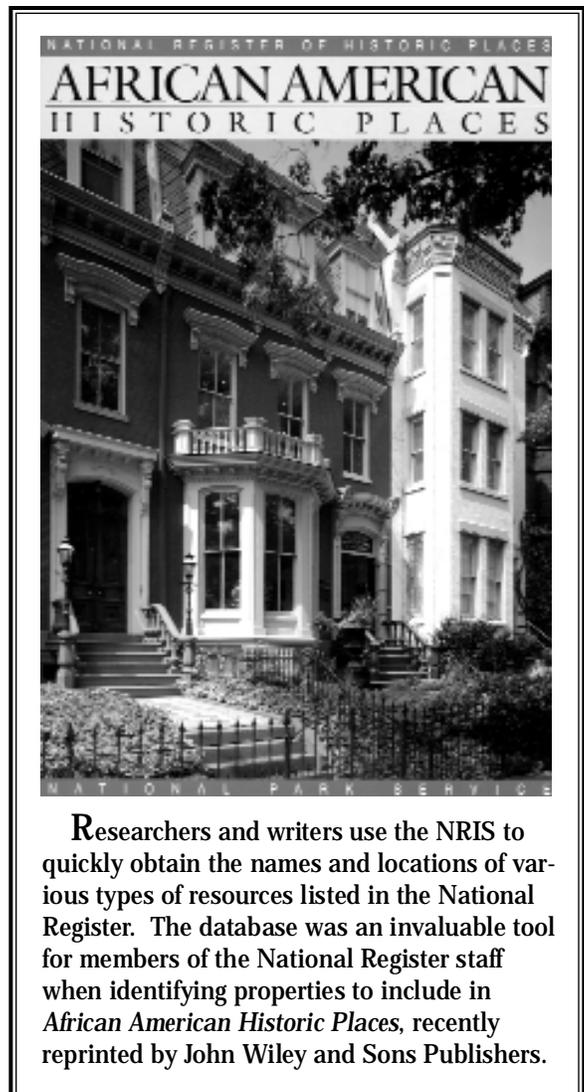
The security of the NRIS has been a high priority both to ensure the accuracy of data and preclude unauthorized changes and to allow the NPS to withhold information that might lead to a significant invasion of privacy, risk harm to the historic resource, or impede the use of a traditional religious site by practitioners. The NPS is authorized to withhold information that might lead to any of these situations under a section of the National Historic Preservation Act.<sup>5</sup> Passwords are required for data entry and to allow different levels of access, and the database is programmed to flag properties for which data should be withheld and to conceal sensitive information except from those authorized to obtain it.

The master database continues to be maintained on the Hewlett Packard minicomputer, which also provides some Internet searching capabilities to the public. The NRIS is transferred to a Windows NT server at regular intervals for public access. An FTP version for downloading and a Web version for simple, preprogrammed searches are available. A goal now is to increase the public's

ability to do sophisticated queries over the World Wide Web using their own combinations of data elements, as we are able to do at the National Register.

**The NPS has an ongoing process of correcting the database and continues to upgrade the NRIS as money becomes available to finance improvements.** One initiative is to add some searchable text in the form of summary paragraphs for each property, and this has been done for a small number of properties. In addition, this year we are beginning a project to scan the full text of registration documentation to facilitate responding to the thousands of requests the NPS receives for copies of National Register files each year, to make the full documentation more accessible electronically, and to help preserve the fragile paper records.

The NRIS has made the National Register of Historic Places more valuable and useful in many ways. Because the National Register has so many entries, searching the records by hand is simply not practical. The NRIS can be queried by such useful data elements as name of property, location, archi-



Researchers and writers use the NRIS to quickly obtain the names and locations of various types of resources listed in the National Register. The database was an invaluable tool for members of the National Register staff when identifying properties to include in *African American Historic Places*, recently reprinted by John Wiley and Sons Publishers.

tect/builder, architectural style, criteria for evaluation, dates, periods and areas of significance, significant persons, historic and current functions, nominating authority, as well as a name search of anything in the database and other pieces of information. **Anyone can use the NRIS on the Web to find which historic places in a community are listed.** Because the location, types and numbers of listings, and contributing resources within them can be quantified, meaningful policy analysis can be done. This has been useful in preparing reports to evaluate the impact of federal laws and legislative proposals, such as those dealing with the federal tax incentives for rehabilitating historic buildings that are listed in the National Register and for workload and other analyses. **The NRIS facilitates preservation planning** by allowing government agencies and others to find historic properties and the National Register documentation on them and to identify gaps and concentrations in cultural resource data. Government agencies and others can take all or portions of the NRIS to create or add to their own computerized databases. Individuals working to evaluate the significance of cultural resources are able to identify similar properties to which they can be compared. **The NRIS is the starting point for a variety of research projects and public education initiatives that identify related historic properties.** In one, the National Register staff queried the database and found more than 800 listings associated with Black Americans as the first step in preparing a book on African American historic places.<sup>6</sup> The National Register

travel itinerary series includes GIS maps that link listed properties of interest to tourists,<sup>7</sup> and travellers anywhere in the world can use the NRIS to plan their trips. A first step in preparing a recent article on Young Women's Christian Association (YWCA) buildings began with a keyword search of YWCAs in the NRIS by name.<sup>8</sup>

Much of America's rich cultural heritage is manifested in the historic places listed in the National Register and in the information about them that is in our national inventory. The National Register Information System has made it possible for the NPS to provide greater public access to these cultural resources. We plan to use the advances in information technology to continue to improve that access and to protect the invaluable records on these places that have so much to teach us about our collective heritage.

#### Notes

- <sup>1</sup> Diane Miller, "23 Years of Automating the National Register," in *CRM*, Vol. 14, No. 4, 1991.
- <sup>2</sup> Some properties determined eligible for the National Register, but not listed, have fewer data elements in the NRIS.
- <sup>3</sup> Explanations and definitions of the categories of information required on National Register forms, many of which are included in the National Register Information System, can be found in *How to Complete the National Register Registration Form* (Washington, D.C., National Park Service, National Register Bulletin 16A, 1991).
- <sup>4</sup> The address for the National Park Service, National Register of Historic Places Internet site is <[www.nr.nps.gov](http://www.nr.nps.gov)>.
- <sup>5</sup> See section 304 of the National Historic Preservation Act, as amended (16 U.S.C. 470w-3).
- <sup>6</sup> Beth L. Savage, ed., *African American Historic Places* (Washington, D.C.: The Preservation Press, National Trust for Historic Preservation, 1994).
- <sup>7</sup> The published National Register of Historic Places "Discover our Shared Heritage" travel itinerary series is cosponsored by the National Park Service and the National Conference of State Historic Preservation Officers and partially funded by American Express. The series has been expanded to produce additional online itineraries on the National Register's Web site <[www.cr.nps.gov/nr](http://www.cr.nps.gov/nr)>.
- <sup>8</sup> Antoinette J. Lee, "Supporting Working Women—YWCA's in the National Register" in *CRM*, Vol. 20, No. 3, 1997.

*Carol D. Shull is Keeper of the National Register of Historic Places, National Park Service. This speech was given at the Information Ecosystem Conference.*

The NRIS plays an important role when creating National Register travel itineraries for the "Discover Our Shared Heritage" series. National Register staff are able to search the database using such data elements as area of significance, period of significance, resource type, and location, ensuring that a diverse collection of historic places is included in the travel itineraries.

