

James T. Wellman. The Transformation of the North Carolina Government Information Locator Service, 1995-2005. A Master's Paper for the M.S. in L.S degree. April, 2005. 34 pages. Advisor: Jeffery Pomerantz.

This paper is a study of the transformation of the North Carolina Information Locator Service (NCGILS) in the decade following its creation in 1995. The changes that NCGILS has undergone mirror then changes in the world of metadata and government information. North Carolina started NCGILS as a librarian-influenced attempt to engage all information creators in producing quality metadata. As a result of several obstacles and issues encountered during the past decade, North Carolina has essentially put NCGILS into hibernation. Today North Carolina relies on automatic harvesting of metadata and centralized efforts by state library staff instead of relying on NCGILS code. This change to an information science driven model underscores the general inability to apply librarian-influenced models in the practical world of government information. The changes, challenges and issues encountered by NCGILS provide a valuable guide for all government agencies and academic students of metadata.

#### Headings:

North Carolina Government Information Locator Service (NCGILS)

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THE TRANSFORMATION OF THE  
NORTH CAROLINA GOVERNMENT  
INFORMATION LOCATOR SERVICE,  
1995-2005

by  
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## **Introduction**

Government information is a hot commodity. It is information that can profoundly affect every citizen and information user. The amount of information created at all levels of government - federal, state, local and international - is staggering. Expanding and enriching the field of government information is the effect that online, digital publishing is having on government information. Now, in theory, every citizen can have easier and flexible access to published government information at any level. But, as Allen Mullen notes in his article on GILS, "the dramatic growth of electronic information resources has proven a tremendous challenge to access"<sup>1</sup>. In addition to the federal government, individual state governments also produce immense amounts of information and data of use to citizens. And state government agencies are also responding to this challenge of access. Whether they are succeeding, failing or if it is too early to determine.

This paper will study one state government's attempt to provide quality access to its digital records. The state chosen is North Carolina, known for quality records management, a strong government presence on the web and innovative approaches to electronic records management. In particular, North Carolina took an early lead in developing and implementing a metadata scheme called the Government Information Locator Service (GILS). Metadata schemes were developed in then 1990's to facilitate resource discovery and preservation of digital and web documents. This paper will provide an overview of the

North Carolina Government Information Locator Service (NCGILS), North Carolina's adaptation of the federal GILS scheme. It will focus on the origin, history and current status of this initiative, and also study what lessons can be learned from NCGILS.

Government information, whether state, national or international, plays a hugely important role in our modern society. The need for strategies and schemas that can extract information and provide access to an information hungry society cannot be underestimated. The entire GILS project, while not without its problems, has done a fantastic job in creating and improving access to government information worldwide. It may indeed be superseded by events and schemas outside the world of government information<sup>2</sup>. The tensions between traditional librarians and modernist technical staff have affected the development of the scheme, but not hindered it<sup>3</sup>. The development of GILS worldwide has transcended the classic debate of theory versus practice. It has also shown up the classic tension between catalogers and technical staff, but no more than other digital schemas and standards. The global perception of GILS may be quite negative, but since the late 1990's the state GILS initiatives have saved the schema from complete oblivion, and will continue to redefine government information access. The most exciting aspect of GILS, and the state initiatives, is their youth. The state initiatives are still not ten years old, and any learning curve will have its negatives and positives. The next few years will hopefully produce excellent research and study on the effectiveness of the state projects, especially NC GILS. And though most technical staff have lamented the demise of resource sharing and integration in favor of resource discovery, this move has been the savior of GILS in many opinions. Concentrating of bibliographic access is a simplicity that leads to success<sup>4</sup>.

The practical application of metadata concepts is one of the most exciting areas to study. Academia has studied metadata for years, and will continue to study it into the future, but the real merit of metadata schemas lies in their ability to be applied to some real task. Ultimately this is a tension between theory and practice, the eternal argument between academia and the "real world". Metadata is a perfect device to illustrate this tension. Metadata presents academics with endless discussion and study, but the real determination of its viability will take place outside of academia, in the world of business and government. Collaboration and cooperation between academics and professionals have produced the most fruitful applications for metadata. Several excellent standards and schemas developed in this manner exist, and are evolving the way information is discovered, shared and used in the digital world.

There are plenty of practical applications of metadata. Various information communities have developed metadata schemas that serve their particular interests. For example, there is GEM - the Gateway to Educational Materials - a schema that facilitates resource discovery for the educational community. There is also EAD - Encoded Archival Description - a standard that covers access to archival and manuscript collections. Most major information communities, from geographic information systems to art and architecture, have developed schemas pertinent to their resource needs. This paper is concerned with the schema developed for government information, entitled GILS - the Government Information Locator Service. This paper will focus on the adaptation and use of GILS by one American state, North Carolina. North Carolina has developed a program called, appropriately, NC GILS. NC GILS seeks to classify and make available North Carolina state documents in an online environment. This paper evaluates the structure

and implementation of NC GILS, attempting to determine if the effort is successful and sustainable for the future.

While federal information has been studied in detail, a growing field of interest is the impact of digital publishing on state information. The individual state governments publish loads of information digitally - at least one state (Illinois) produces as much as 150,000 web sites<sup>5</sup>. Given the individuality to all fifty of the United States, there are conceivably fifty different ways to provide government information to citizens. There has developed a standard called GILS - the Government Information Locator Service. This standard was developed first by one federal agency, and has gradually broadened and developed as a general standard for any government entity. But this standard has not been uniformly applied by the various fifty states.

Beginning in the mid-nineties, the individual states began to approach to problem of applying the federal GILS model to their individual needs. North Carolina was one of the states that took a proactive lead in producing a state-specific metadata scheme to its own information. The schema and office North Carolina officials developed, called the North Carolina Government Information Locator Service (NCGILS), received a great deal of praise for its far-reaching approach and high ideals. NCGILS sought to apply a librarian approach to the creation and maintenance of metadata, relying heavily on information creators (individual state agencies) to determine their own metadata. NCGILS also opted to rely on the Z39.50 international standard, something other states, notably Washington, chose not to do. However, over the past decade, practical usage and political expediency caused a major change in NCGILS. Much of the initial emphases of NCGILS had to be abandoned, and now the once unique NCGILS approach has been

abandoned in favor of the technology-based approach favored by Washington State. It is these changes and their implications for the future this paper will address.

This paper also will address the tension, and even conflict, between the role of librarians and information scientists in the world of metadata creation. The role of librarians in metadata has always been one that prefers standards, controlled vocabulary, strict conformity to rules and generally a major role for information creators in also assigning metadata. The information scientist role has been one that favors a freer approach to standards, emphasizes keyword searching over controlled vocabularies and relies on technology to harvest and supply metadata rather than individuals. NCGILS mirrors a greater conflict between these two schools of thought throughout the information world, and this conflict is both frustrating and refreshing. Frustrating in that much of the time the conflict retards solutions to issues in electronic information, yet refreshing to know that, circa 2005, this paper will provide a (hopefully valuable) perspective on how this conflict will resolve itself.

The story of NCGILS is a story of this conflict, how the program began as an effort to promote a librarian-influenced scheme yet ended with the realization that the information science role was more efficient. NCGILS can also be an analogy on the emerging argument over the validity of metadata itself, whether metadata should be produced or simply ignored. This paper will also hope to provide some valuable comment on whether metadata is a valid concept to study and apply; in short, whether metadata - applied to government information or any information - is worth it.

## Background

Research covering metadata applications by state government is sadly scarce. Some literature concerning GILS and state agencies was published during the first big push in the mid- to late-nineties. There were excellent articles written as the various state GILS initiatives began, an excellent preview for a new program. A second group of articles on this topic comes from before and after the turn of the millennium. This material is retrospective and very relevant to this topic. Most distressing is the lack of good articles specifically relating to North Carolina's GILS project, but that is one area this research is attempting to address.

GILS, and metadata in general, seems to go through cycles of public interest. There was a great deal of professional and even personal interest in GILS as a scheme in the mid-nineties, stimulated by federal initiatives and support. This interest waned as professionals in state government encountered the complexity of GILS and the even greater complexities of state government information. Like most of the private sector, state government information creators simply do not understand - or worse, care to understand - the role of metadata. While the subject has immense academic appeal and support, in the real world it has very little. Consequently, the rush by state professionals to implement their new schemes met a less than enthusiastic welcome. This naturally also affected scholarship on the matter, and is arguably accountable for the scarcity of articles available on GILS today. But this statement in no way undermines the quality of the articles available. While few, they are generally of high quality.

Eliot Christian was one of the trailblazing authors on writing about GILS. Some consider him the preeminent authority on the subject.



His work is considered fundamental to explaining and promoting the scheme, and his work was very influential to the North Carolina professionals<sup>6</sup>. He essentially wrote the primary manual for GILS on the web that is still accessed and considered relevant today.

William Moen is another author vital to the understanding of GILS and its applications by state governments. Moen wrote extensively on GILS, usually in conjunction with Charles McClure. Like Christian, these two were very instrumental in explaining and promoting GILS in the early stages, and their works have been very instructive to this paper.

Much of the information available also tends to be promotional of one system. It may be the case that GILS initiatives at the state level have reached an early, but critical, plateau. Funding crunches, changing personnel and general dissatisfaction have produced a period of torpor throughout state government agencies. Naturally GILS initiatives are seen as luxury items, or worse, as drains on shrinking funding pools. Nancy Zussy's articles on Washington State's GILS imitative (WAGILS) and the production of *Find-It!* (Washington's primary application of their metadata) has been very useful in understanding how an IS application of GILS works.

Works by Jessica Milstead in describing the Jessica Tree - a controlled vocabulary produced specifically for a GILS application in Illinois - has proven very useful in understanding how GILS can be used in a librarian's world. Milstead's research interest has been indexing and the use of vocabularies and thesauri, and while most of her articles do not directly deal with GILS, they do provide valuable insight into the role of using thesauri within metadata applications. Her work generally laments the ignoring of strong thesauri by most commercial producers, something that has a strong connection to the

story of NCGILS. One major reason the NCGILS program team decided to develop a basic standard was because of the lack of good indexing and keyword searching available in the mid-nineties. However, technology and the marketplace began to produce good keyword searching as well as commercial products that provided workable indexing, drastically changing the outlook of the NCGILS team. This is discussed in this paper below.

This does not say that articles of this type or not useful. It has been very illuminating to read the articles dealing with the Jessica Tree and its creation. Especially important is the reasons why certain controlled vocabularies were needed. Also necessary was why the vocabularies followed closely to state government organization. Essentially, it is easier for information creators to apply metadata that mirrors or follows their own agency's role in state government. Similarly, it is also helpful for searchers to search for information based on state government agencies as opposed to thematic searches. Currently, North Carolina is developing databases that do both - arrange information both by agency and larger themes. It is exciting to know that researchers can now use portals to search for all information dealing with court cases or hazardous material, rather than first studying government agencies and trying to find out which one would suit their purpose. In this way the original NCGILS metadata is proving valuable, in that the complex scheme allowed for cross-reference by agency and subject.

Unfortunately, NCGILS is still too young for to have produced strong evaluative knowledge proving its success. This is especially true regarding how the individual agencies are creating their own metadata. However, North Carolina provides the best hope for ultimately evaluating the GILS implementation, as other states do not

allow access to their GILS records<sup>7</sup>. Eventually this openness will lead to North Carolina being on the cutting edge of future GILS research, and will only benefit the state and the NC GILS program.

Shortly after NCGILS was begun it was the subject of another master's research at the University of North Carolina, by Heather Bumbalough. This research was a case study geared heavily toward public records access, and was written very early in the program's history. It has been extremely interesting to compare Bumbalough's thoughts and predictions about the program with its ultimate outcome. The research that produced this paper is essentially an extension of Bumbalough's initial paper, not an epilogue but rather a chapter two in what will hopefully be a long and interesting story.

### **The Government Information Locator Service**

To understand how NCGILS came into being, and how it changed, it will first be necessary to understand the world of GILS, the parent scheme.

GILS - the Government Information Locator Service - was developed within the last twenty years. Its first incarnation was as the 'geographic' information locator, developed in the 1970s for the geographic community. The huge increase in government publishing, especially digital publishing, led to interagency initiatives that transformed GILS to a broader schema in the 1990s<sup>8</sup>. The major initiative to develop a program was "how to integrate and reduce duplication in data collection by federal agencies"<sup>9</sup>. The term 'geographic' in the title was supplanted with the term 'government', to underscore this change in scope. The key document for the change was the Office of Management and Budget's Bulletin 95-01 (December, 1994), which mandated GILS be used by all federal agencies. This document was also used as a foundation to create a GILS community, made up of government and information professionals, to implement GILS as a government wide standard. In 1997 a report on this implementation was released, authored by William Moen and Charles McClure. This report was very important and influential, as it defined a new role for GILS within the government community. One thing the report noted was that GILS had too many "expectations"<sup>10</sup> attached to it, and this was invariably leading to disappointment and even failure for the project. Most of the failed expectations derived from the heavy-technical aspect of the GILS at that point. This strong technical emphasis, however, was counter-productive to widespread GILS use. One author noted that GILS was "sufficiently complex to ... discourage participation" from the key agencies producing government information<sup>11</sup>. Therefore, the

Moen/McClure Report recommended that GILS concentrate on resource discovery, and eschew (initially) any other technical emphasis such as resource integration and resource sharing. This proved to be a major political selling point. GILS would now fit wonderfully with the American citizens' desire for access to government information, a desire that has increased infinitely with the development of the World Wide Web. In fact, Ernest Perez notes that "the appetite for GILS ... arises from the Jeffersonian and Enlightenment ideal of the informed electorate"<sup>12</sup>. At this point GILS became "designed to support fundamental information policy principles"<sup>13</sup> such as the Freedom of Information Act and government disclosure. Also, it has been noted that users of government information are not seeking entertainment but utility<sup>14</sup>, so prioritizing resource discovery helps the public good. Thus GILS had a new goal and a built-in mandate that found wide appeal among citizens and civil servants alike.

Other national governments, notably Australia and Canada, also began to use GILS. These national adoptions provided mixed results, and GILS is not viewed favorably on an international basis. However, the international scope led to yet another name change, from 'government' to 'global' information locator service. Since the name change was not widespread, both interpretations of GILS - government and global - are in current usage today. (As an aside, this dual naming leads to frustrations, especially in searching for information about GILS online and in article databases.) Ultimately individual American state governments began adopting this schema, either outright or modifying the federal model. Individual state governments within the United States are also prolific information producers. And like the federal government, state government web publishing also exploded without a coherent, cohesive planning<sup>15</sup>. Most state governments looked

to the federal initiatives for guidance and emulation, and it was natural that they would also follow the federal lead regarding GILS. So, shortly after the OMB directive regarding GILS for federal agencies, state agencies began producing similar GILS initiatives. These state programs began quickly after the final GILS report<sup>16</sup>, roughly around 1998, and varied in their approach and implementation.

Initially, five states adopted GILS initiatives based strongly on the federal model<sup>17</sup>. North Carolina was among those first five states, along with Florida, Missouri, New York and South Carolina<sup>18</sup>. Several other states chose to implement GILS programs that differed from the federal model, the best example being Washington State. In 1996 Washington began an initiative entitled WAGILS, which fused Dublin Core elements with the federal GILS model. Both were very new at the time, Dublin Core tracing its history back to 1995<sup>19</sup>. A big difference between WAGILS (and other state initiatives based on it) and the true federal model is the role of Z39.50, the international standard supported by the federal government. WAGILS decided not use Z39.50 for searching, although for searching instances WAGILS can be mapped to Z39.50<sup>20</sup>. Also, WAGILS is focused on digital documents on the web<sup>21</sup>, as opposed to the federal model that includes non-web documents. North Carolina's model, developed at the same time, takes the opposite approach to WAGILS, and includes most government information products and records, and is not restricted to web documents<sup>22</sup>. While North Carolina does not include all available government records, the scheme is very inclusive. Both WAGILS and the standard model have proved popular, and currently both are still too young to really determine in one or the other is superior, or if both can survive. As Allen Mullen notes, "NC GILS is too new"<sup>23</sup>.

Both models have had their problems. Most of the problems have been understandable given the world of government information. The sheer size and volume of government information<sup>24</sup> is the first major obstacle to overcome. This is only exacerbated by issues such as budget constraints, training and territorial clashes<sup>25</sup>. But the increase in government information has been the driver in creation of GILS and the state GILS initiatives. Another major issue has been the tension, and even clashes, between the creators of GILS themselves. The creators have tended to fit into two broad categories: traditional catalogers, dependent on standards, and modern technical-oriented information professionals who see no need for standards. This tension can be seen in the development of two different strains of state GILS initiatives. The WAGILS system does not rely on international standards such as Z39.50 and is clearly more geared to automatic generation. The 'standard' GILS system, where North Carolina's project lies, is geared to traditional methods and relies heavily on Z39.50.

Other states that have taken a lead with GILS are Illinois, Texas and Utah. Of strong interest to this paper is the development of a vocabulary by the state of Illinois. Jessica Milstead, a consultant for the Illinois Find-It!, developed a controlled vocabulary to be used and accessed by creators and library. She named it after herself as *The Jessica Tree*. This vocabulary was a great attempt to bridge the divide between the librarian's need for controlled subject headings, and the expediency of information creators to produce information. The vocabulary is relatively simple and based on the outline of government information as created by Illinois agencies. It was made available both alphabetically and hierarchically (the hierarchy again based on Illinois state government organization). The Jessica Tree was a trail blazing program that spawned several similar vocabularies in other

state agencies, notably New Mexico and Texas. Most other states simply referred to their vocabularies as subject lists. Use of these subject lists and vocabularies was generally voluntary, and again underscored the limited role that information professionals and librarians have in forcing state agencies to use proper metadata creation methods - if they can influence use of metadata at all.

The overall success of state initiatives has varied greatly. Many of the state initiatives have been driven by individuals, and have tended to flourish or flounder depending on the careers of these individuals. In several states, the individual responsible for pushing the initial GILS implementation has either left that agency or retired, resulting in stagnation in that particular state. GILS has tended to flourish where there was as strong group effort, or where the individual has continued to be aggressive or productive in the field of metadata.



**NCGILS**

North Carolina's GILS initiative began in September 1996, with state Executive Order 100. A coordinating committee was established to implement this program, and the initiative was dubbed (appropriately) NC GILS. This committee produced the NC GILS Guidelines in 2000, and updated them in 2003. Per the NCGILS web site, The committee focused philosophically on the "public's need for information, not on the documents that contain the information nor any specific technology". This principle has been the driving force behind the program, and takes a very traditional librarian's view toward information access, and not a technical bias towards technology. The other stated principles of NC GILS were also heavily oriented toward the public's ability to access and use the information, definitely in line with Moen & McClure's call for the refocusing of GILS<sup>26</sup>. A refreshing principle stated by NC GILS is that "success is measured by the precision and organization of the documents found, not the number"<sup>27</sup>. This principle emphasizes quality over quantity, and again follows the programs interest in providing the public with the widest and best state information.

In producing these guidelines the NC GILS committee drew from other standards, primarily database standards specific to North Carolina agencies. In this manner it is also somewhat a hybrid, but not on the scale of WAGILS. In essence, NC GILS added several data elements not present in (US) GILS in order to satisfy public records law requirements<sup>28</sup>. Also, NC GILS sought to be compliant with the Federated Metadata Repository (FMR). This repository, a project of the North Carolina Statewide Technical Architecture (NCSTA) plan, and produced by the North Carolina's chief information officer, sought to provide uniform guidance for all state data produced, a plan that was both complimentary and competitive to NC GILS. It attempted, or will

attempt, to coordinate data among North Carolina's state agencies and encourage collaboration. Sadly, the FMR is currently inactive. The impetus behind North Carolina's adoption of NC GILS was to provide easier access to state records for the state citizens<sup>29</sup>. Essentially, the state sought to provide access to all state information from single portals, eliminating the need for citizens to search in a variety of portals or locations for state information<sup>30</sup>. The plan called for a decentralized production, with individual agencies given the option of hosting their information on their own equipment, or submitting it to a central server<sup>31</sup>. This allowed for differences in agency technical expertise as well as familiarity with metadata production. Along with NC GILS the coordinating committee started a central search site on the web. This would simplify the way citizens could search and access online information. This was entitled FIND NC, and was funded by the Library Services and Technology Act<sup>32</sup> to provide library-like access to government information. FIND NC enhances NC GILS by providing excellent citizen access to information<sup>33</sup>. FIND NC essentially uses the metadata created by NC GILS to produce a central catalog, and this catalog is prominently advertised on the state's website and via library services such as NC Live and individual database aggregators.

A dominant feature of NC GILS is that metadata information is created by the individual agencies, not a central cataloging office<sup>34</sup>. Therefore information creators, who should now more about the information they create, are considered the best persons to assign NC GILS information. This also places more emphasis on the cataloging tradition, which advocates human input in metadata creation. By contrast, WAGILS promotes embedding metadata in the documents themselves<sup>35</sup>, a much more technical approach. Ostensibly this embedded

metadata is geared toward harvesting and automatic generation. It also works well with WAGILS' web-only document approach.

NC GILS utilizes Z39.50 to integrate information between the central repository and the individual agencies<sup>36</sup>. This mirrors usage of this international standard by the federal GILS programs. Again, adherence to an international standard is very much in line with traditional cataloging, and promotes an international interoperability for the schema. There are several major Z39.50 servers operated by NC GILS. Among the databases are LINC (Log Into North Carolina), which contains census and demographic information for the state; marc archives, which connects to MARC records of the Archives and Manuscripts collections in the State Archives; and databases for health/human services, state agency operations and commerce department records.

NC GILS has also taken the step to index web pages. They have done this by developing HTML tags via an adapted language entitled, appropriately, NC GILS HTML. The tags for this language are embedded in the web page source code. Indexing web pages fit into the overall mission of NC GILS to provide access to a wide variety of government information. As stated earlier, NC GILS indexes a variety of information, not just "born digital" or "web only" documents. In addition to web resources, NC GILS also catalogs cd-roms, popular and highly sought print items, select public records and mixed format material.

The actual elements of NC GILS are quite extensive. Although Dublin Core was not used as a basis, it is easy to see similarities. Essentially there are numerous adaptations of the basic metadata elements. For instance, instead of one element for author, there are five elements for 'originator' that all apply to the specific

government agency. While extensive the metatags for this scheme are geared to easy creator input, and for excellent bibliographic citation. Not every tag need be used, and certain elements are repeatable. As with government publisher, there are extensive tags for distribution, cost, agency identification and agency contact. NC GILS could be easily cross-walked to Dublin Core and other schemas. Basically the entire NC GILS template could be considered extended Dublin Core records, if there was a need.

Though not directly part of NC GILS, the FIND NC program illustrates how well NC GILS is working. As stated earlier, the primary philosophy behind NC GILS (as with all state GILS initiatives) is resource discovery for the citizen. FIND NC provides a simple but effective interface for citizens and government workers to find and access state material. The interface is widely available via the web. The state maintains the website at <http://www.findnc.org> and also promotes links via both academic websites and commercial vendors like NC Live. There is also staff at the State Library providing reference support for FIND NC, including electronic mail reference. The goal of FIND NC is to provide access for a variety of users, including state employees, students, genealogists and most importantly the North Carolina citizen. The most important thing about FIND NC is that it is still under development. The service has been unavailable in the distant past due to development and budget constraints. This is an all too common side effect of new technology and new services. One very helpful feature added the FIND NC is a complete index of state collections at the North Carolina State Library. State government information is notoriously difficult to research, and this index provides one more enhancement.

### **NCGILS Today**

NCGILS has undergone dramatic changes in the past five years. After the initial implementation in 1998, major obstacles began presenting themselves to the NCGILS staff. Most of these obstacles are inherent in the implementation of any new technology or information scheme. Training, acceptance and support were the major three issues confronted by NCGILS.

As Joel Sigmon noted, training was meant to be the cornerstone of the new system<sup>37</sup>. It was always the intention of the NCGILS program to provide constant training and support to government agencies throughout North Carolina, and offer a wide array of web resources also. But time and staffing did not allow the level of training first envisioned by NCGILS. Much more training was needed than anticipated, and the limited financial and staff resources necessitated curtailing this vital component. This shortcoming was to prove the first downward step for NCGILS<sup>38</sup>.

Acceptance proved a difficult obstacle. In retrospect, NCGILS early reliance on creator input was naïve. Most creators of state government information lack the expertise or even interest to adequately assign their own metadata<sup>39</sup>. The emphasis in state agencies is simply on creating and posting information in the quickest manner. Most staff in state agencies do not have an academic background in information systems, nor any real interest in the finer points of information access and retrieval. Metadata is simply an abstraction or luxury to most state agency creators, something that is expendable when compared to the daily rush to produce information and meet other job requirements. This concept has severely undercut the idea - and ideal - of having creator input in metadata.

Support proved the final obstacle for NCGILS. It is always difficult to garner enough money and legislative support for new programs, and NCGILS was no exception. Although NCGILS had a very general blessing and acceptance by high-level administrators, it would not be enough to save the entire program when a budget crisis arose. Although personnel and administrators in the State Government committed themselves to new technology, the NCGILS program was too abstract and complex for them to truly support<sup>40</sup>.

A major bump that NCGILS had to deal with was the death of state depository initiative. This was the plan to comply with the Federally Mandated Repository (FMR) scheme that had partially driven the creation of NCGILS. This initiative was terribly unsupported almost from the beginning, with only a few state agencies contributing information. At first it was thought this initiative would provide negative competition to NCGILS, but this never materialized. In the end, only statistical information was contributed, and so this initiative itself transformed itself into the State Data Center (SDC), a clearinghouse of state statistical information that is current (as of 2005). The SDC is working with the OSP to produce the next generation of state information initiatives, essentially the children of NCGILS<sup>41</sup>.

Another huge problem encountered by the NCGILS team was dealing with Z29.50. Although this international standard originally figured prominently in the creation of NCGILS, for practical purposes it proved a nightmare. Z39.50 proved too complex and inflexible, and it thwarted most attempts to expand NCGILS. From North Carolina's perspective, Z39 is essentially dead<sup>39</sup>. In retrospect, Joel Sigmon - the father of the NCGILS program - notes he would not have relied on Z39.50 if he had known how difficult the standard would become<sup>42</sup>.

Shortly after the new millennium North Carolina underwent a severe budget crisis, shared by most state governments. This budget crisis meant a reduction in most non-essential government services, and the NCGILS program was considered non-essential. The NCGILS program was also faced with the re-assignment of key personnel, including Joel Sigmon, essentially the "father" of NCGILS<sup>43</sup>. At this time, roughly 2001, NCGILS was put on hiatus. The principal players were assigned to other offices and other tasks.

But significantly, NCGILS was not eliminated or retired. The program still ostensibly remains, with the web presence still there and the NCGILS code still active and available for use. However, the code is no longer maintained or updated. At first this situation would appear unworkable. But Joel Sigmon explains that although the code is currently not being maintained, it is still viable and proves that all the efforts of the NCGILS Task Force were not in vain<sup>44</sup>.

NCGILS proved to be adequate for its time - the late nineties and early millennium, when technology was still advancing but had not yet produced adequate search engines for complex government information. NCGILS was a great idea for such a time when metadata would prove essential in cataloging electronic information. However, in the past few years there have been significant advances in search engine capability, and this has rendered much of NCGILS' original reasoning redundant. Citizens and civil servants alike can find what they are looking for by keyword searching. Such keyword searching may not be the best searching available, but it gives the citizens quickly what they want. NCGILS' role as an intermediary between searcher and information has now become cumbersome, both for the creators to apply and the searchers to learn. This also mirrors attempts in other information fields to catalog web resources.

Although NCGILS has essentially ended as a method in itself, it has not been a failure. NCGILS has become a valuable foundation for several current database and information projects in North Carolina. NCGILS has not died but rather transformed itself from a daily scheme to a framework to build databases. There are several current projects, managed by the North Carolina State Library and the Office of State Planning which are using NCGILS as a foundation. But, instead of relying on creator or publisher input, these databases will use harvesting technology to gather appropriate metadata, and then load metadata into databases that will have practical usage for citizens and civil servants alike<sup>45</sup>.

The fact that the State Library is now continuing much of the metadata and cataloging of North Carolina electronic records underscores the fate of NCGILS. NCGILS could have provided a decentralized approach to metadata creation that would have removed the onus from the centralized state library, but this approach has failed. Now North Carolina is adopting the centralized approach used by most other states. While this is sad, it is considered the most effective and efficient way to catalog electronic resources<sup>46</sup>.

One thing that has made North Carolina switch to automatic harvesting of metadata has been the improvement of commercial software. One company that has developed workable software is Blue Angel. Blue Angel Technologies, of Pennsylvania, is a developer of information management systems for both corporate and government settings. Currently North Carolina is using Blue Angel to provide automatic data harvesting<sup>47</sup>. The advances of Blue Angel software has been a terrific boost to current metadata efforts in North Carolina<sup>48</sup>. Today North Carolina uses Blue Angel software to drive the internet search engine called FIND NC<sup>49</sup>. Find NC was an early version of a one-stop portal



that could provide access to a wide-range of information. Another program that used NCGILS was Log Into North Carolina (LINC). Both FIND NC and LINC are still available for web searching, though not as current or powerful as originally intended. Another commercial software package under consideration by North Carolina is the Voyager/Encompass Tool offered by Endeavor Information Systems. The point is that North Carolina now trusts commercial software companies to provide reliable tools to use instead of relying on local programs such as NCGILS<sup>50</sup>.

The major thrust in North Carolina is towards developing strong portals for government information. Currently a Portal Committee has been formed, ultimately to produce a better web point for accessing North Carolina digital information<sup>51</sup>. Current programs being developed by both the North Carolina State Library and Office of State Planning are using databases built with NCGILS to provide such a one-stop information stop. An expanded database is also being developed where information from several agencies can be accessed by this one portal. In the past, searchers could only access information from one agency at a time. The development now is geared to providing data cross-referenced from many agencies. If a searcher enters a query for housing costs, they will be given a list of various information data from various agencies. This is much more effective, and beta versions of such portals look very good<sup>52</sup>.

The current status of NCGILS is much reduced from initial expectations. Since NCGILS has proven so complex, a scaled down version of the schema has been developed called NCGILS Lite<sup>53</sup>. NCGILS Lite is a schema that still has the essential elements of the original NCGILS, but is much smaller and (in theory) easier to comprehend than its complex parent. There are also plans to develop a DTD (Document

Type Definition) based on NCGILS Lite to bring the NCGILS program up to current developments in archiving and records management. DTDs are used with XML markup language, and XML is the dominant online language being used. However, these developments are not public as of Spring, 2005<sup>54</sup>. But the thrust of new NCGILS and NCGILS Lite will be aimed at mapping them to DTDs, in order to make them more compatible with XML.

## Analysis

There is a lot of rich analysis to be done with NCGILS and its current applications. The most stunning concept in this paper has been the realization by NCGILS that their original concept of a librarian-centered scheme with creator input was unworkable. The idea has generally been remembered as good and noble<sup>55</sup> but one that was completely unviable in the long run. As has already been noted, the creators of state information - not only in North Carolina but throughout the nation - lack the expertise or even interest to produce acceptable metadata. It is both easier and more efficient to rely on harvested information. In this matter the technology concept has won out.

Technology has undergone great advances in metadata harvesting and keyword searching, and this has really bolstered the IT-concept with GILS. GILS made great sense when compared to technology that was either lacking or commercial technology providers that were unreliable. However, both situations have changed. Technology today is highly advanced and very nuanced. As records management has become very important, commercial IT companies have responded with excellent code and processes that can identify quality metadata from digital documents. Also, whereas before several commercial companies suffered financial reverses and bad management, the current crop of companies - especially Blue Angel - seem to be trustworthy and solid (as of 2005). The winds have changed in favor of IT.

Given the apparent victory of the IT emphasis in North Carolina, what can be said for the librarian model in metadata? Much of the debate and friction between the IT model is carried on in academic environments, but has become a moot point in business and government. As changes in NCGILS has shown, the librarian model has been put way

back on the shelf, if not entirely forgotten. The increase and speed of government information production has necessitated an approach that is quick, inexpensive and requires little hassle for creators. This IT model fits all three of these criteria. Even State Libraries have abandoned the idea of having state agencies create their own metadata. In North Carolina today the State Library is involved in creating metadata and workable databases on their own, and are doing so quite successfully.

The transformation of NCGILS from a librarian-concept to an information-science-concept is actually not as stark as it may seem. There still is a great deal of librarian influences in the new NCGILS spawned programs. The new state portals rely heavily on mediation and expertise, as opposed to providing a frustrating user-driven menu like most information-science programs. This is also happening in most commercial pc applications. The newer databases represent a pleasing fusion of librarian sensibilities with information science's pizzazz and efficiency. The ultimate switch to an automatic harvesting by the North Carolina state agencies will be a boon to government information in the state, and hopefully will once again be trend-setting on the national scene<sup>56</sup>.

In summary, NC GILS was a strong, yet unworkable metadata schema. Its goal of providing citizen access to state information was both noble and successful. It was a credit to the information professionals from North Carolina who attempted such a complex and critical task. However, these same professionals realized when NCGILS had served its purpose, and new directions needed to be pursued.

The apparatus behind NC GILS is competent. Although any reliance on Z39.50 has been abandoned, this has freed NCGILS and its successor programs to be more flexible and efficient. Dropping even the Dublin

Core will allow even greater flexibility for metadata usage in databases and programs under development.

While it is still too early to make a final pronouncement on NCGILS, the research clearly indicates that the schema was a great tool for its time, has provided a firm foundation for current projects, and will continue to provide impetus and foundation for future advancements in state government information. In conclusion, NC GILS is an admirable application of the Global Information Locator Service, and one that continues to serve.

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