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Purpose

Comprehensive, readily accessible, searchable databases containing the location and significance of the Nation’s historic properties are essential for informed decision making. As the number of recorded cultural properties grows, it becomes increasingly difficult and time consuming to consider the effects of proposed actions on historic properties. Convenient, quick, and consistent access to information collected on cultural resources is vital for the timely, accurate, and cost-effective completion of the Section 106 review process. This makes the creation and maintenance of comprehensive and accessible databases fundamental to the entire preservation program of the twenty-first century. The goals of this survey were to identify the existing data management conditions at the state level and assess how those conditions have changed since the initial survey conducted in 2007.

Methodology

Answers to the survey questions from 2008 will be compared to the answers from the same or similar questions posed to SHPOs in 2007. In cases where a question was new for the 2008 survey, the responses to that question will be considered without regard to the 2007 survey. There were fewer respondents to the 2008 survey making direct comparison between the two surveys difficult for some questions.

Survey Participation

In 2007, 47 states (94%) and Puerto Rico responded to the survey. In 2008 only 35 states and Puerto Rico responded to the questionnaire (Figure 1). Despite the fact that participation dropped, the sample size is large enough to make comparison between the 2007 and 2008 surveys possible.

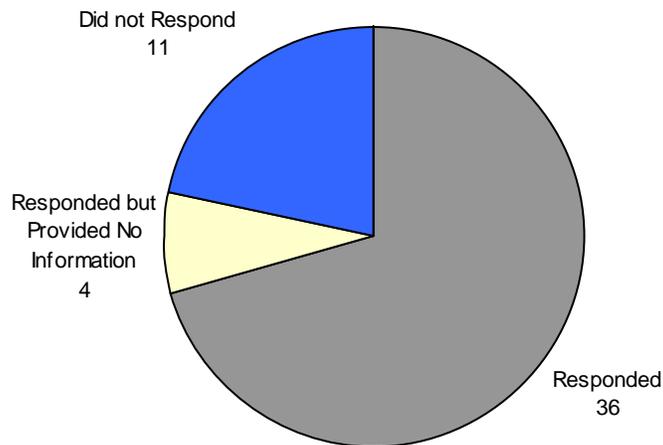


Figure 1. Responses to the 2008 Survey

Electronic and GIS databases

Questions:

Percentage of surveyed acreage of your state (include federal, state, private, other lands) in an electronic database (include all acreage that have identified archaeological sites and standing structures)?

Percentage of cultural resources for which you have data in an electronic data system? Historic and archaeological sites (on land and underwater)? Standing structures?

The first set of questions in the survey is aimed at ascertaining the current state of SHPO electronic data systems. For the purposes of these questions, any type of entry, from the most basic data to complete site/inventory data, counts as a record in an electronic database. On average, a majority of surveyed acreage, historical and archaeological sites, and historic structures have some form of entry in an electronic database (Figure 2). Several offices report that all or most surveyed acreage and cultural properties have an entry in a database, while a few states report that they have no survey or cultural property records in an electronic format. Interestingly, both the average percent of surveyed acreage and the average percent of cultural properties with entries in a database dropped between the 2007 and 2008 surveys (Figure 3). One possibility is that the states that responded in 2007 but not in 2008 had generally higher rates of data entry into electronic data systems. Based on the data, this appears to be the case. A majority of states that did not respond in 2008 reported 100% coverage in 2007.

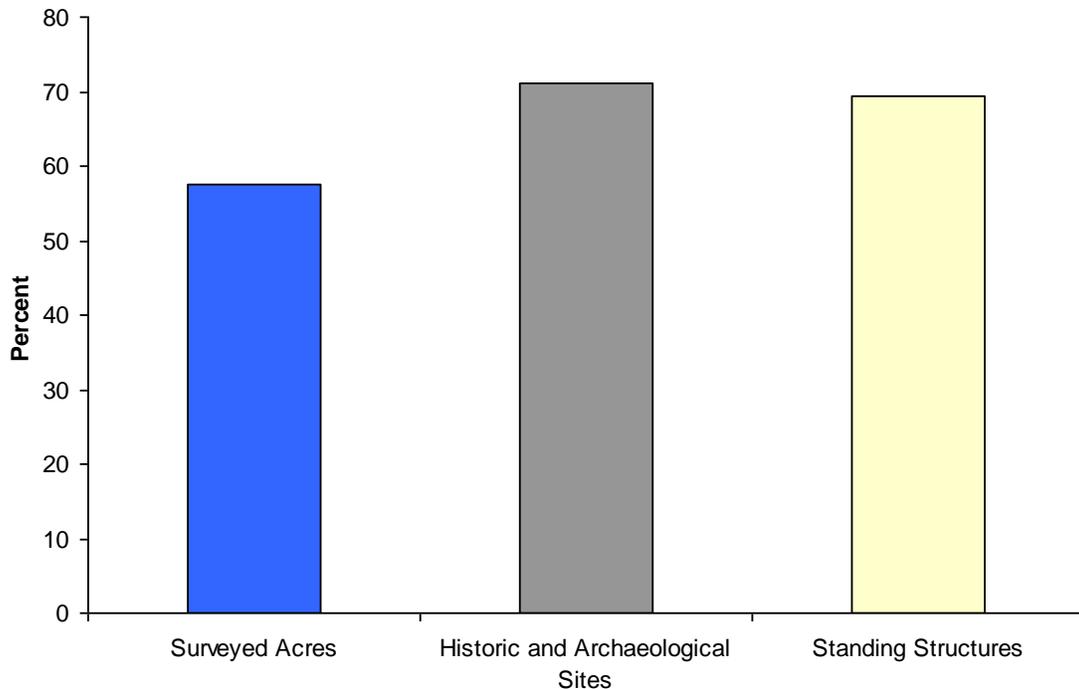


Figure 2. Average Surveyed Area and Cultural Properties with Electronic Database Entries

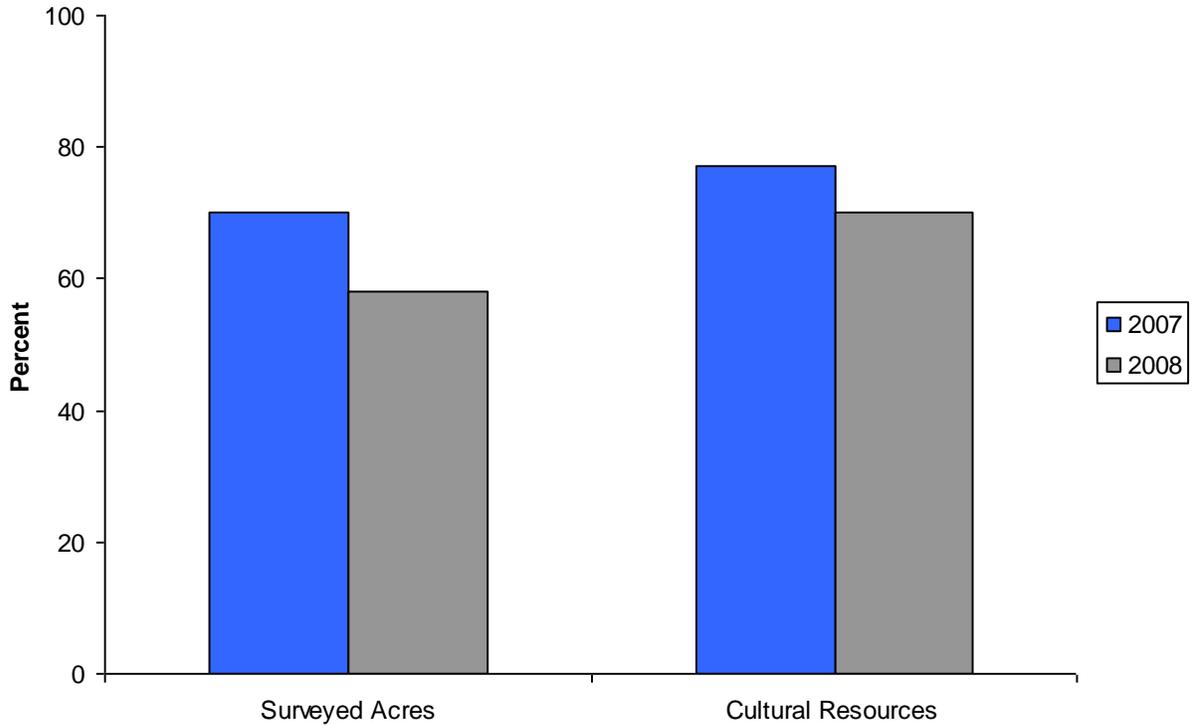


Figure 3. Average Database Coverage in 2007 and 2008 (note: cultural resources include historic and archaeological sites as well as standing structures)

Question:

Are historic and archaeological resources maintained in the same electronic database?

To determine the extent to which each state office has integrated historic structure programs and archaeology programs, we asked whether a separate database was maintained for each type of cultural resource. Fifty-nine percent of SHPOs reported that separate databases were maintained for archaeological resources and standing structures (Figure 4). Roughly half of those reporting separate database systems also report that one or more of the databases is maintained by an entity other than SHPO. Comparable data is not available for the 2007 survey.

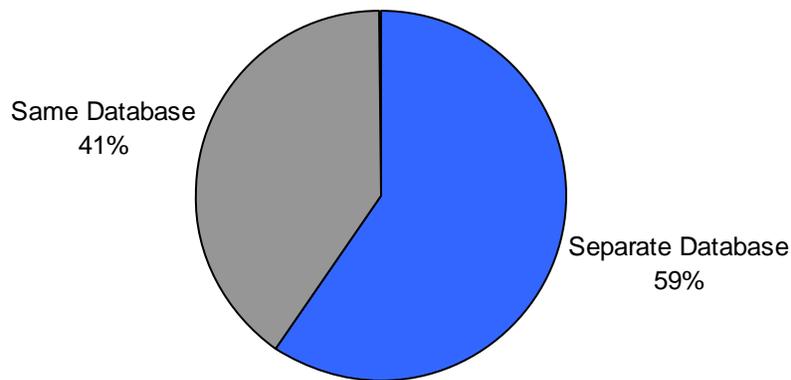


Figure 4. Separate Databases for Archaeological Sites and Standing Structures?

Questions:

Percentage of surveyed acreage in a GIS? Archaeology (on land or underwater)? Standing structures?

Percentage of archaeological and historic resources for which you have data in a GIS? Archaeology (on land and underwater)? Standing structures?

In addition to entry in an electronic database, we also asked about the percent of inventory and cultural resources that have been entered into a Geographic Information System (GIS) database. A few states reported that they have entered all archaeological survey, historic building survey, archaeological sites, and standing structures into a GIS. While there are a handful of states reporting that they do not have a GIS system in place, the majority of states are in the process of entering data into a GIS. On average, a smaller percentage of survey and cultural resources have been entered into a GIS than have been entered into some other type of electronic database. Currently, archaeological survey and archaeological resources are more likely to be in a GIS than are historic structure survey areas and historic structures (Figure 5). Comparing the 2008 results to the responses from 2007 is complicated by the fact that we changed the categories between the two surveys. In 2007 we simply asked about the percent of survey and cultural properties in a GIS. In 2008 we split the survey category to include estimates for both archaeological survey and historic structure survey; we also split the cultural properties category into historic and archaeological resources and standing structures. If the categories from 2008 are collapsed to just two categories, one for inventory and one for cultural resources, then there appears to be virtually no change from 2007 to 2008 (Figure 6).

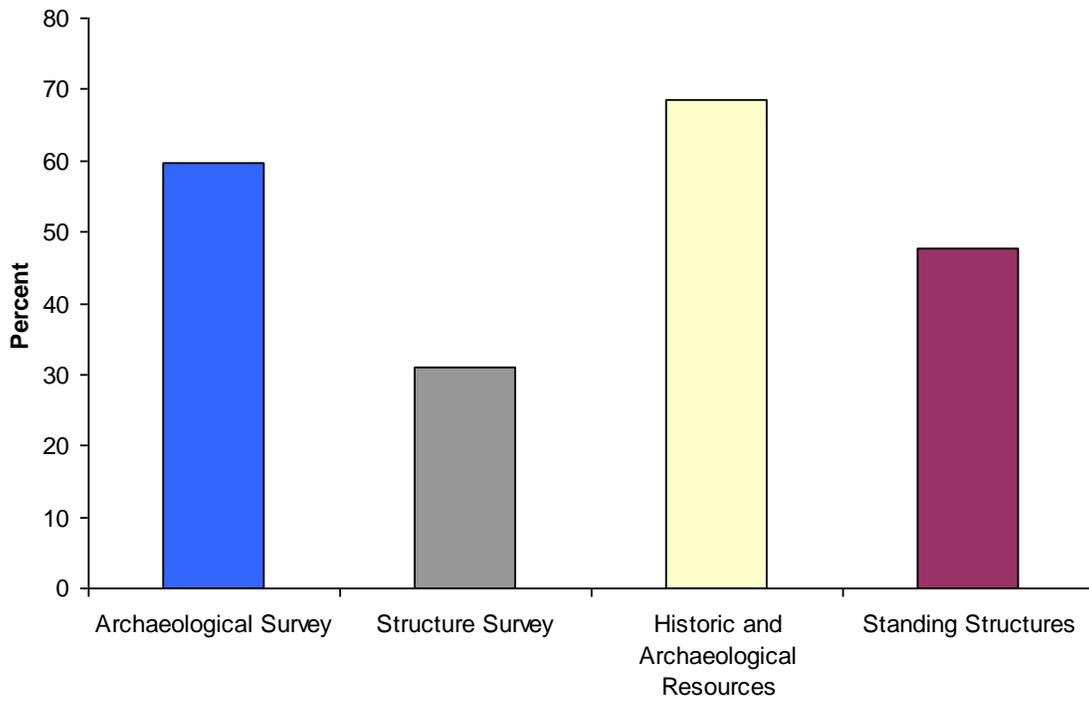


Figure 5. Average Percent of Survey and Cultural Resources Entered into a GIS

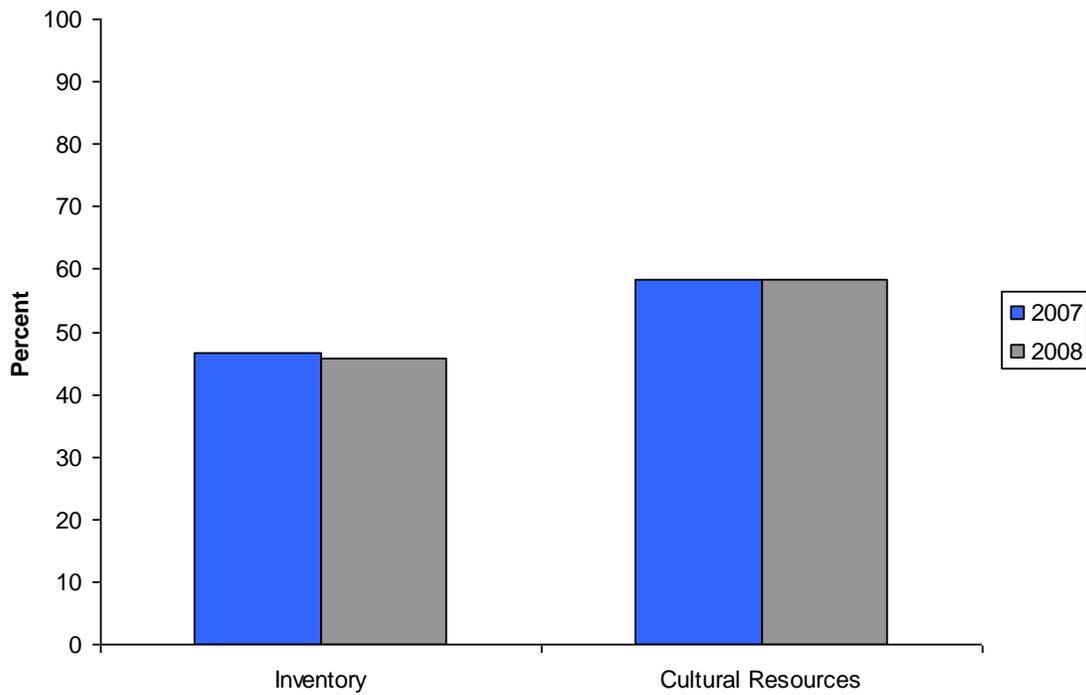


Figure 6. Average Inventory and Cultural Resources in a GIS

States that responded in 2007 but not in 2008 did not have significantly higher or significantly lower rates of GIS entry than states that responded in both 2007 and 2008. In other words, the lack of response by some states does not appear to be depressing the average rate of data entry into a GIS. Some states reported increases in the percent of survey and cultural resources in GIS databases, while other states reported declines in this area. Declines are likely the result of 1) better knowledge on the part of each SHPO of the state of their data systems, 2) the change in wording of the question, or 3) a reflection of a system that has not been maintained at a rate equal to the amount of new work coming into the office.

Data System Costs

Questions:

Cost estimate to bring all previously identified archaeological and historic resources and survey projects (legacy data) into a GIS and an electronic data system.

Estimate any other technical costs not currently budgeted (hardware, software, technical development, support).

In addition to asking about the current state of SHPO digital storage systems, we also asked each SHPO to estimate the costs for bringing all legacy data into the current electronic data system(s) and the cost for hardware, software, maintenance, technical support, and development. The aggregate cost for the 21 states that provided an estimate for their legacy data was nearly \$24,000,000. The average cost per SHPO was over \$1,000,000 (Figure 7). In addition to the legacy data, the same 21 states reported more than \$5,000,000 was needed during the year to cover other technical costs. In 2007, 36 states reported a slightly higher average cost for bringing legacy data into current electronic data systems but a slightly lower average cost for other technical costs (hardware, software, development, etc...) (Figure 8).

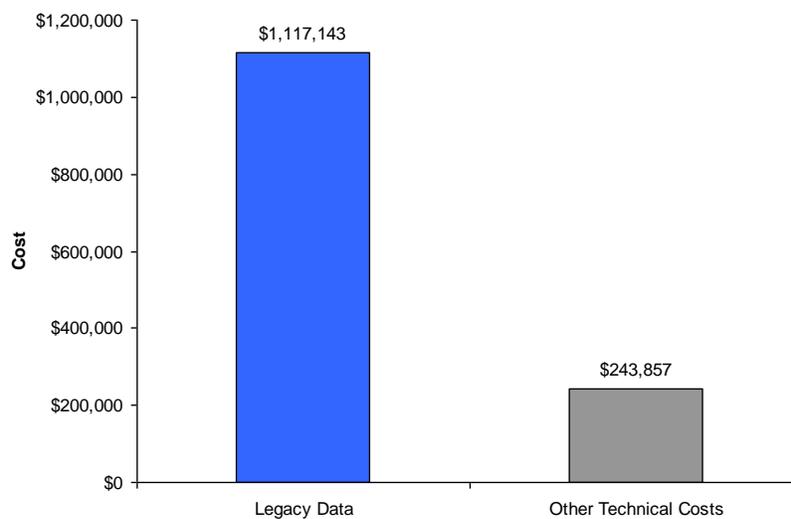


Figure 7. Average Cost Per SHPO Office

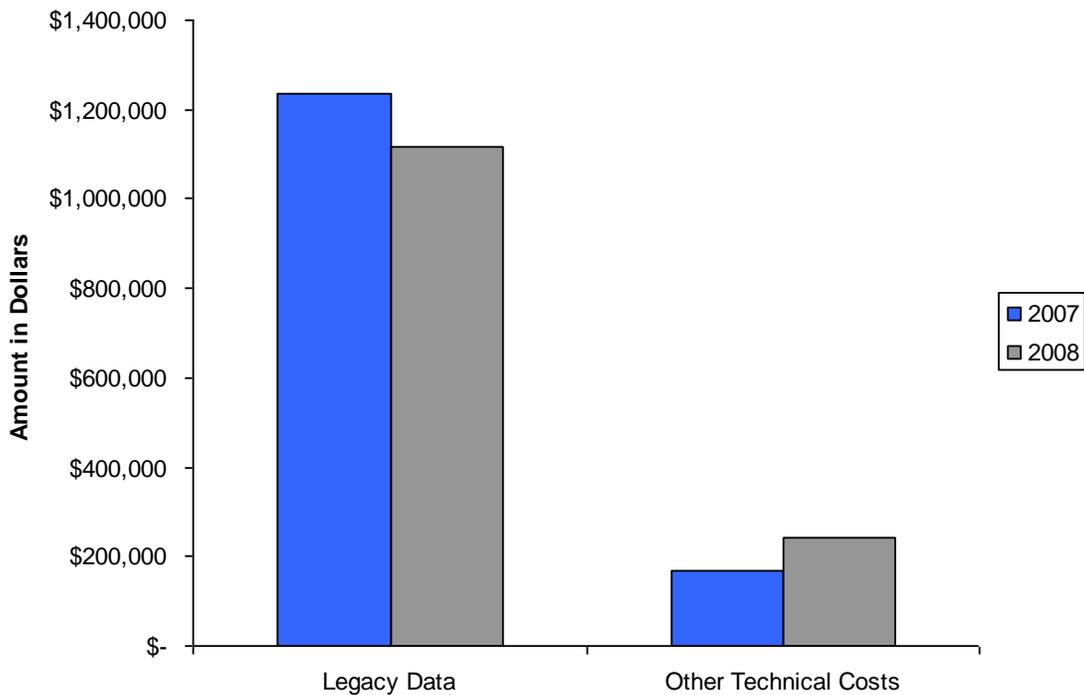


Figure 8. Comparison of Average Cost Per SHPO for 2007 and 2008

Document Imaging

Questions:

Are you imaging documents and/or photographs?

If yes, percentage of documents and/or reports and site forms in an electronic or imaged format (scanned document storage system).

Provide a cost estimate to complete imaging of all documents.

A significant majority of SHPOs are imaging documents (Figure 9). The ratio of SHPOs imaging documents remained relatively unchanged between the 2007 and 2008 surveys (Figure 10). Despite the fact that most SHPOs are imaging documents, on average, only about 20% of the inventory reports and site forms from any given office have been imaged (Figure 11). The PDF format is the preferred imaging format, though other formats such as the Tagged Image File Format (TIFF) and the Joint Photographic Experts Group (JPEG) format are also employed (Figure 12). Of the 19 states that reported an estimated cost to complete all document imaging, the mean cost per SHPO was over 1 million dollars. In 2007 the 27 states that estimated the cost for completing all document imaging yielded a mean per office of less than \$500,000. This difference appears to be largely controlled by a number of states who estimated that it would take no additional funding to image all documents in 2007. No state provided an estimate of \$0.00 in

2008. If the null values are removed from the 2007 survey, then the average estimate per office for the 15 offices that provided an estimate is much closer to the 2008 average (Figure 13).

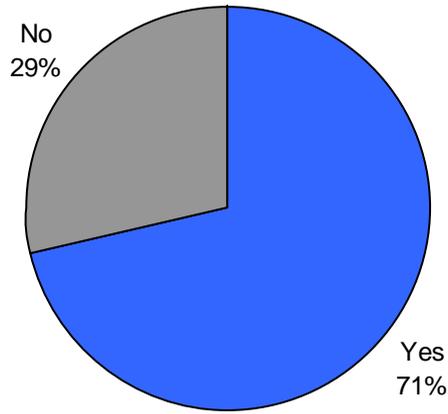


Figure 9. Percent of SHPOs that are Imaging Documents

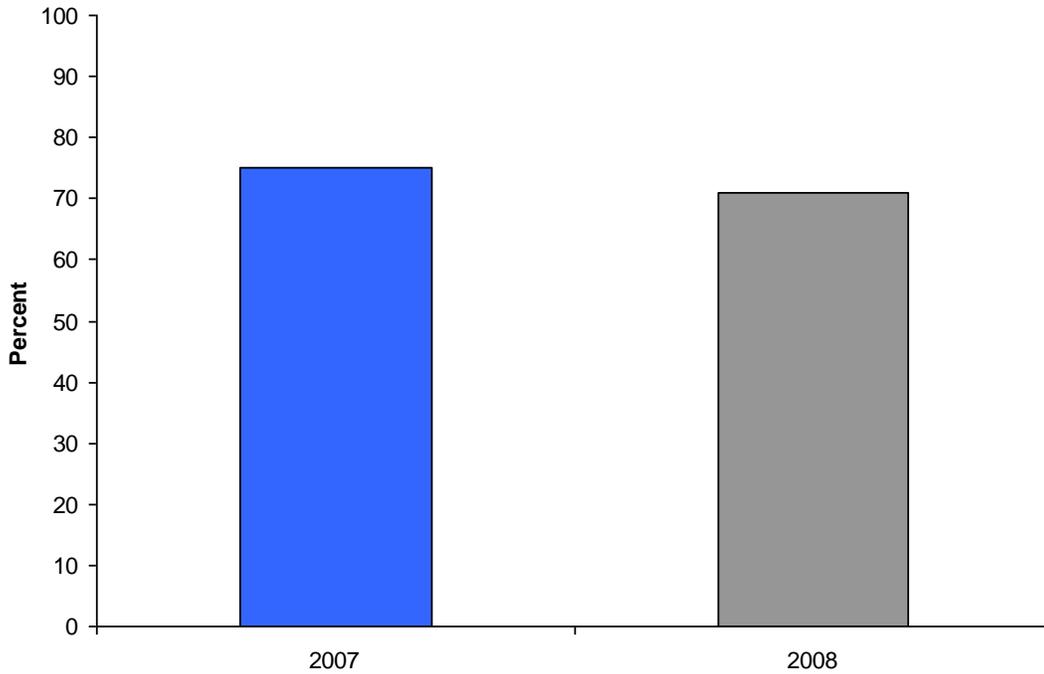


Figure 10. Comparison of the Percent of SHPOs Imaging Documents in 2007 and 2008

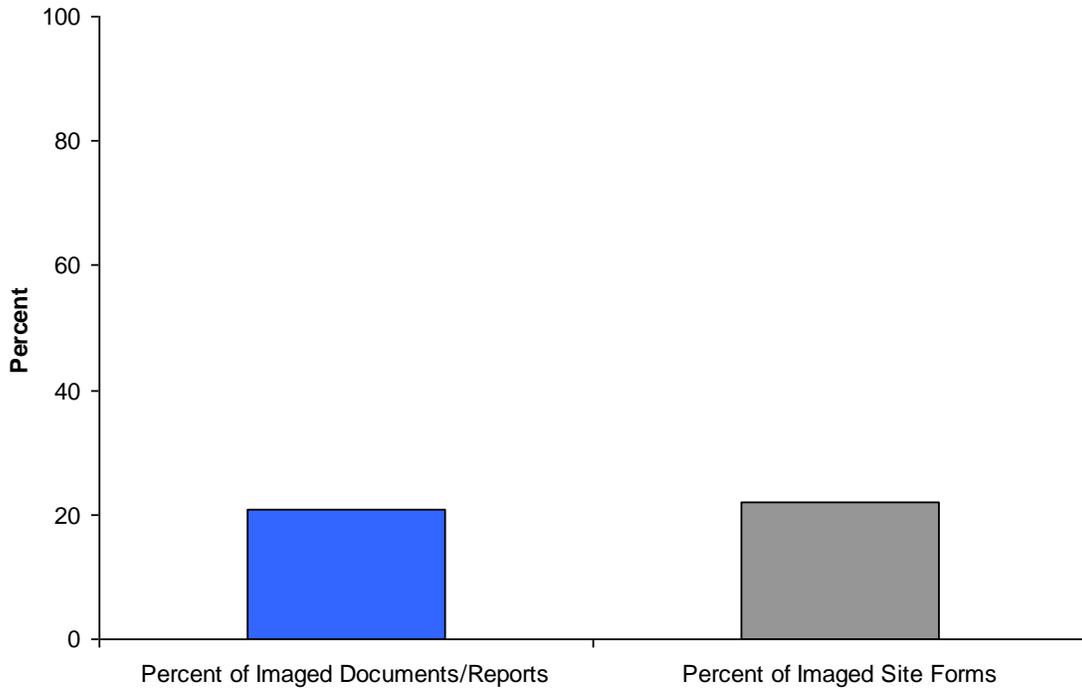


Figure 11. Average Percent of Imaged Inventory Reports and Site Forms as Reported in the 2008 Survey

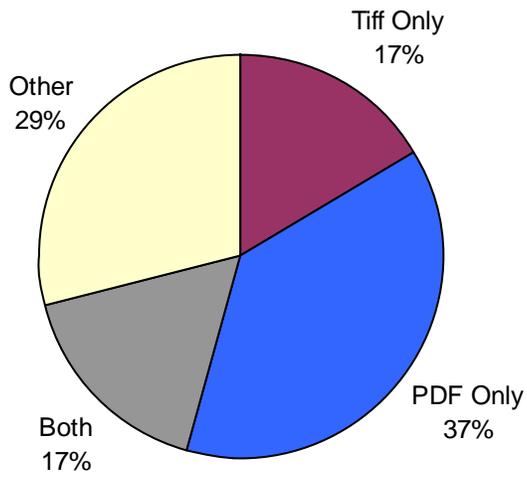


Figure 12. Types of Imaging Formats Employed by SHPOs

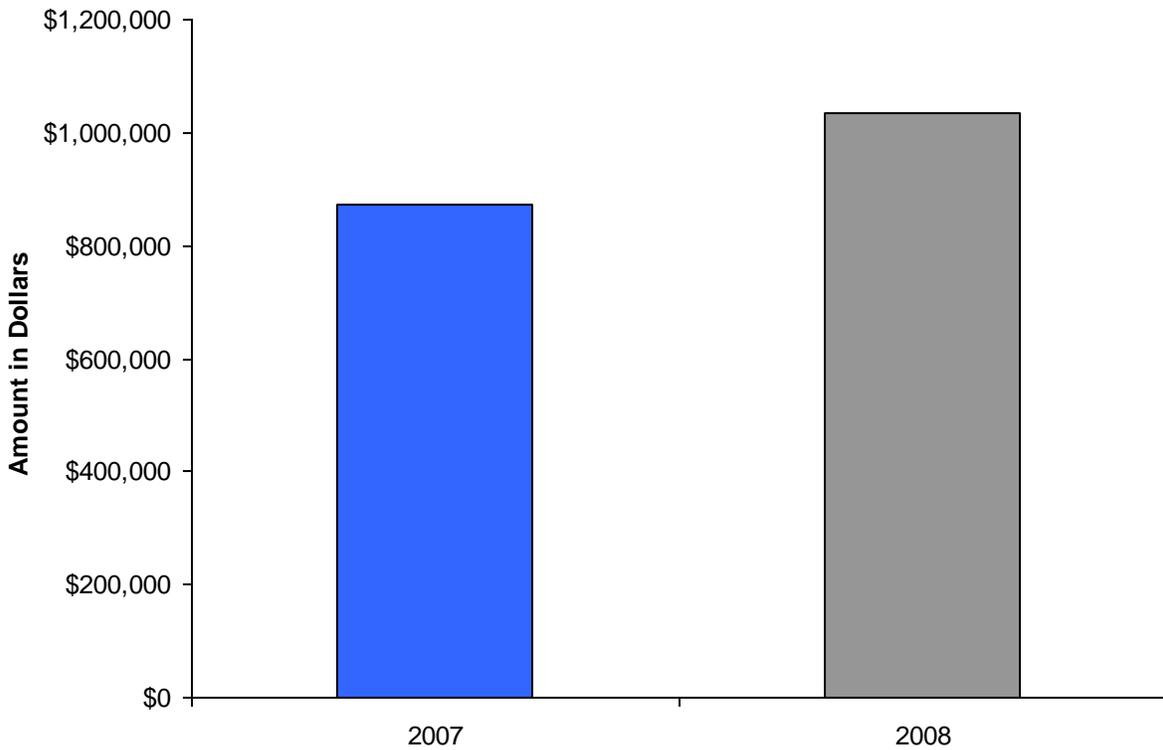


Figure 13. Cost Estimate Per SHPO to Image All Documents

Data Access

Questions:

Are your electronic data systems currently available for use (by SHPO staff? By Agencies and Consultants? By the general public?)

What type of data is most frequently accessed?

Part of the appeal of electronic data systems are their accessibility, so we were interested in determining how the existing databases are being accessed and what types of information are most frequently viewed. All of the 33 states that responded to the question regarding access to their electronic databases currently have internal SHPO access to those databases. A smaller number of SHPOs allow access to these databases by federal agencies, while even fewer allow access by the general public (Figure 14). Figure 15 shows the types of data that are most frequently accessed from these electronic databases. The frequency with which spatial data and inventory data are accessed indicates that we need to focus first on these types of data. No comparable data is available from the 2007 survey.

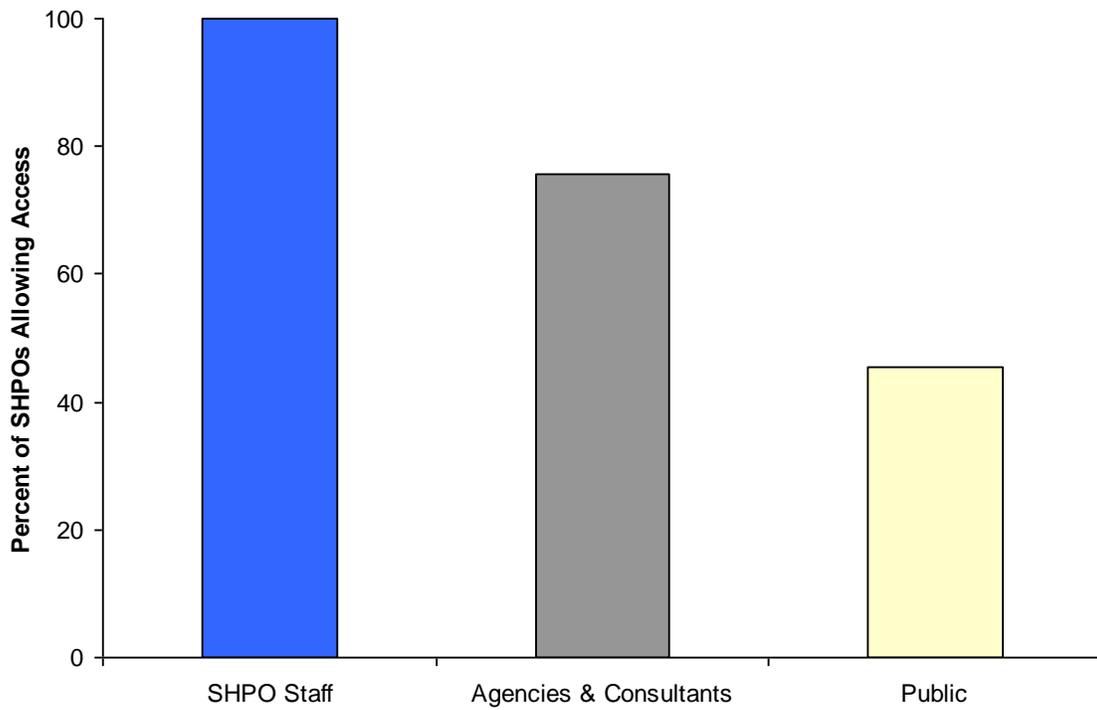


Figure 14. Access to SHPO Electronic Databases

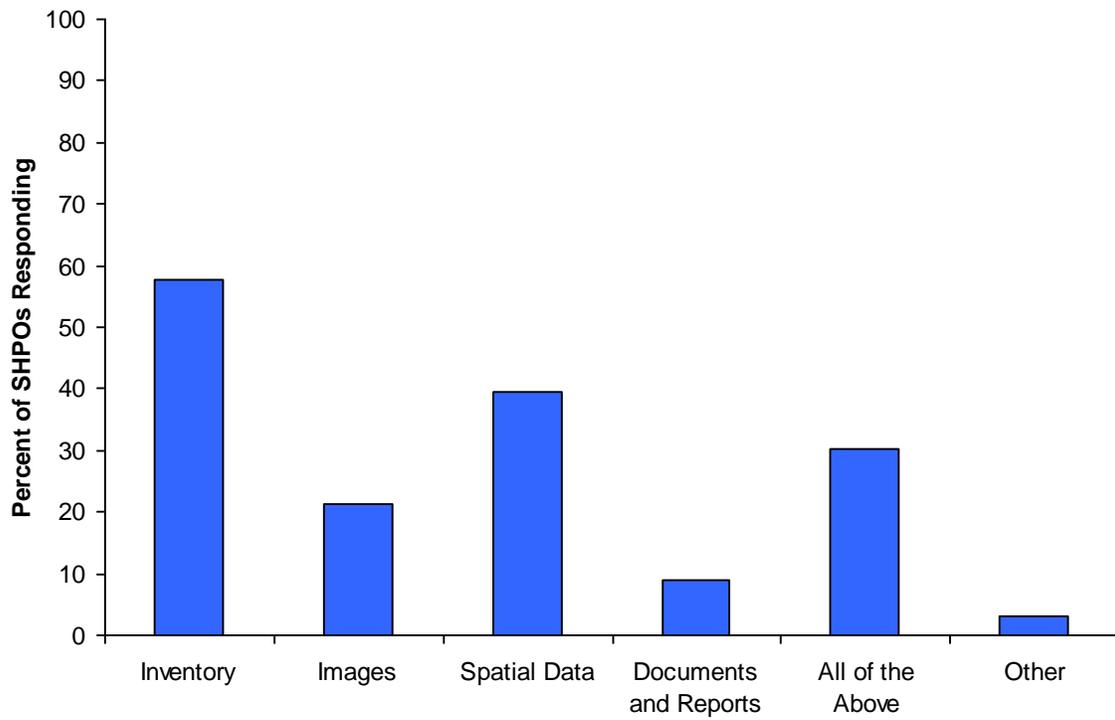


Figure 15. Types of Electronic Data Most Frequently Accessed

Data Entry

Questions:

Information is entered from paper records by: SHPO staff? Other?

If other, by whom?

How are records updated or information added? Consultants submit digital information via the internet. Consultants submit digital information via FTP. Other

If other, please explain.

The next set of questions in the 2008 survey dealt with how SHPOs are entering data into existing electronic data systems. Nearly all SHPO offices responded that information from paper records is entered into electronic databases by SHPO staff (Figure 16). Consultants, interns, and temporary contractors are also employed to enter information from paper records. New data is entered into SHPO data systems in a number of ways. Many offices still rely on paper hardcopies that are entered by SHPO staff. However, there are a significant number of offices that have moved toward digital submissions. Almost 25% of responding SHPOs are accepting digital submissions via the internet. Still other offices are accepting submissions via email or on CD/DVD. No SHPOs are accepting digital submissions via FTP. No comparable data is available from the 2007 survey.

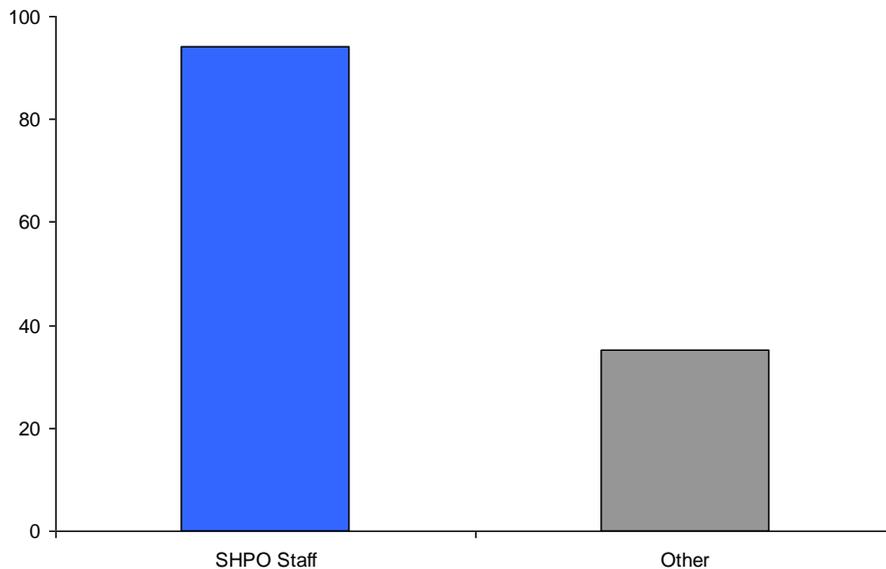


Figure 16. Who Enters Information from Paper Records into Electronic Databases?

Staffing, Training, and Budget

Questions:

What is your typical annual budget for your electronic data systems including personnel, development, software, hardware, and programming?

Do you have a trained IT professional on SHPO staff?

Do you have cultural resource staff with IT experience?

If yes, how many?

How much funding is dedicated to SHPO staff training?

Training is done: in house? By outside sources? Both?

How much time is dedicated to: SHPO staff training (in-house staff); Outside consultant/agency/user training?

With increasing use of and dependence upon electronic data systems for storing and serving information, we wanted to know if SHPOs are employing trained information technology (IT) staff. Currently, less than half of the SHPOs that responded to the survey employed trained IT staff (Figure 17). However, nearly three of every four SHPO offices have at least one employee with some IT experience (Figure 18). The typical IT budget for a SHPO Office (including personnel, development, software, hardware, and programming) was just over \$100,000 per year.

Just over 70% of SHPOs indicated that they engaged in staff training. This was an open-ended question and was not limited to IT training. The majority of offices that engaged in training conducted both in-house and outsourced training (Figure 19) on a very limited training budget (Figure 20). Unfortunately, answers concerning the amount of time spent on training were not given in a quantifiable way. The typical answer was “minimal” or “not much” or “only when needed”. No comparable data is available from the 2007 survey.

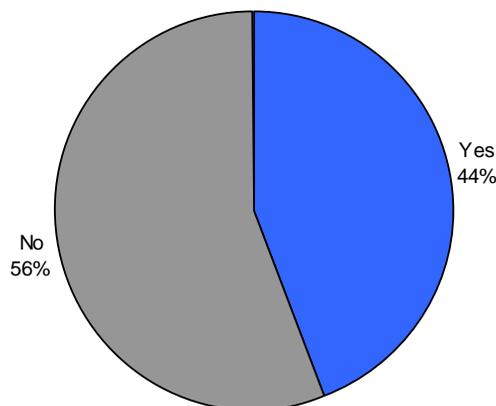


Figure 17. Percent of SHPOs that Employ Trained IT Staff

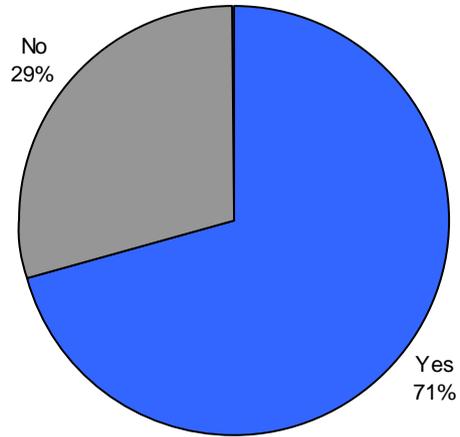


Figure 18. Percent of SHPOs that Employ Staff with IT Experience

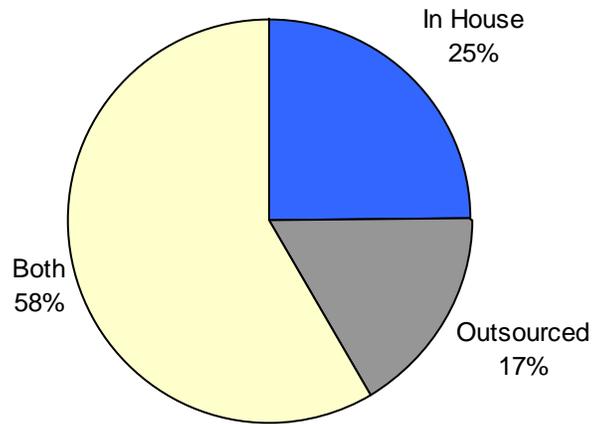


Figure 19. SHPO Staff Training

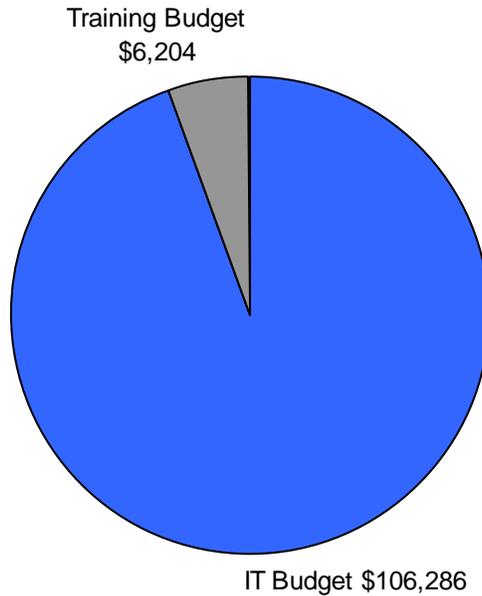


Figure 20. Average Yearly SHPO IT and Staff Training Budgets

Land Surveyed

Question:

What percent of your state's land area has been systematically surveyed for historic buildings, archaeological sites, structures, traditional cultural properties, landscapes and/or districts?

The intent of the question was to assess the total land area in each state that had been systematically surveyed for all resource types. Unfortunately, the question was poorly worded making it difficult to assign any meaning to the results. For instance, a state that has conducted no archaeological survey could respond that 100% of their land area was systematically surveyed because a systematic historic structure survey was completed. Another state could respond that only 5% of their entire land area has been systematically surveyed for all types of cultural resources. This makes comparisons between states impossible and renders the average land area surveyed meaningless. With this in mind, the results of this question are presented in Figure 21. Some states reported that 100% of their land area has been systematically surveyed, while other states reported that very little of their total land area has been surveyed. The disparity among states is most likely due to the wording of the question and no conclusions should be drawn from this data.

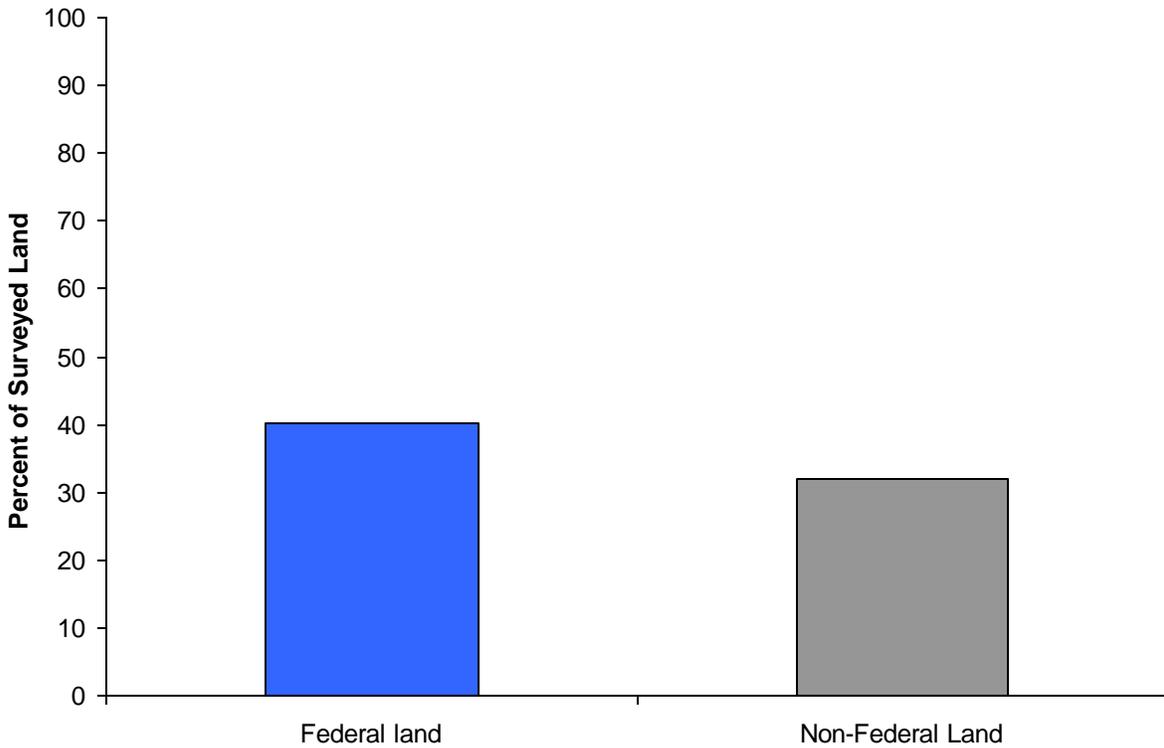


Figure 21. Average Percent Land Area Surveyed Per State (19 States Reporting)

Core Business Model

Question:

Would you be interested in participating in the development of a core business/data model that captures common data for SHPOs?

This question was asked to assess the willingness of SHPO to support the collection of a common core of data. Collecting common data would make our data systems more portable and easier to work with for contractors and federal land managers. While the core data collected would be the same, each individual SHPO would still collect and/or record any other information they wished. The vast majority of SHPOs are willing to participate in the development of this core data model (Figure 22). Compared to the responses to the 2007 survey, more SHPOs indicated their willingness to participate in the development of a core data model in 2008 (Figure 23).

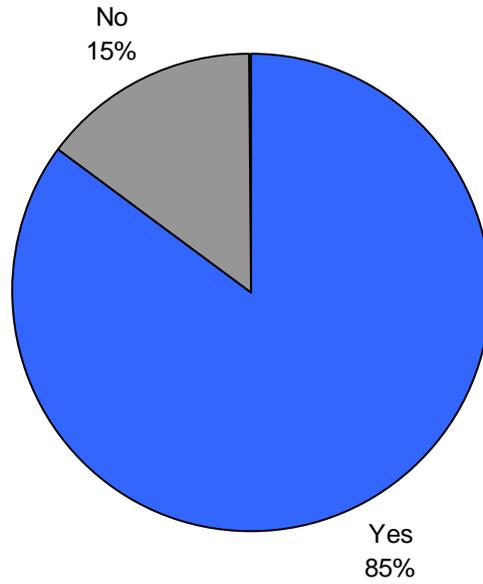


Figure 22. Are SHPOs Willing to Participate in the Development of a Core Data Model?

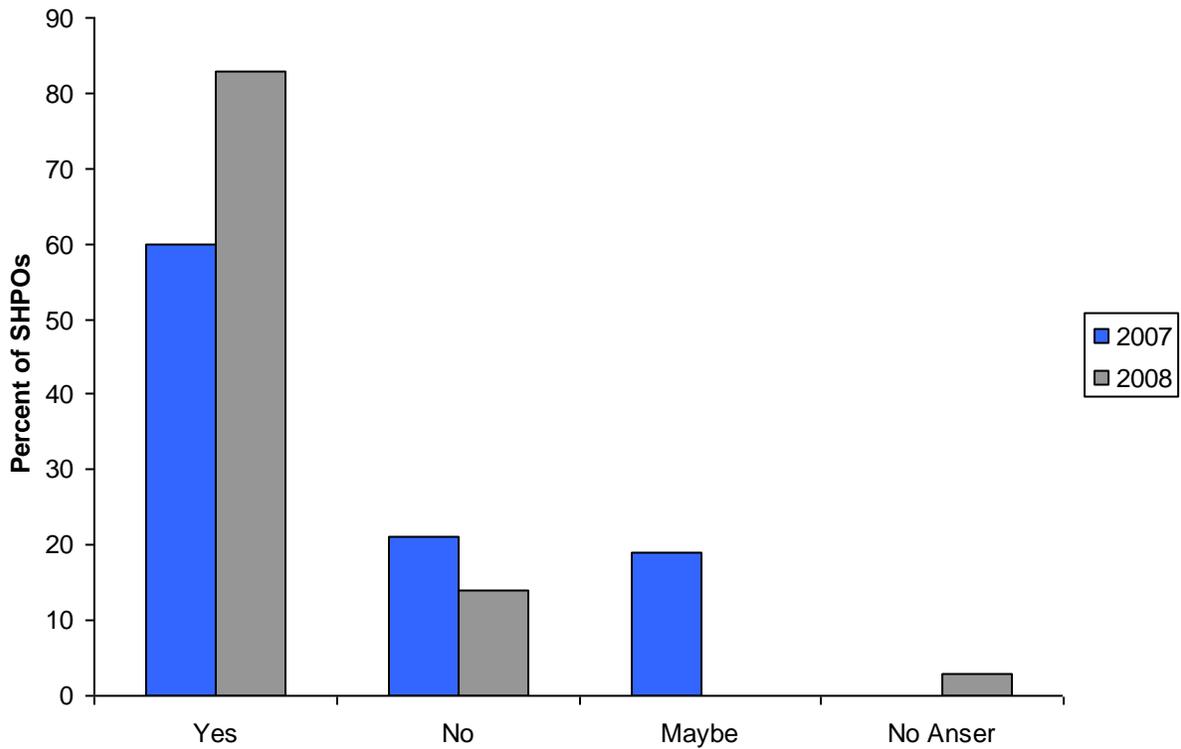


Figure 23. Comparison of 2007 and 2008 Core Data Model Responses

Data Sharing

Question:

Do you share electronic data with other agencies?

Do you have formal data sharing agreements with other federal agencies for the maintenance of your data system?

Who determines access to your database(s)?

If access to your database(s) is part of a cooperative agreement, what tool or tools are in place to govern access: state law, MOUs?

Most SHPOs share data with other agencies (Figure 24). The percent of SHPOs that share data with other agencies increased significantly from the 2007 to the 2008 survey (Figure 25). The increase may be the result of the decrease in participation in the survey from 2007 to 2008. While most SHPOs share data with other agencies, only 33% of responding SHPOs have formal data sharing agreements in place. In nearly all cases, the SHPO controls access to SHPO databases. In 6 cases, access to SHPO data is controlled in whole or in part by cooperative agreements with land managing agencies. There is no comparable data from the 2007 survey

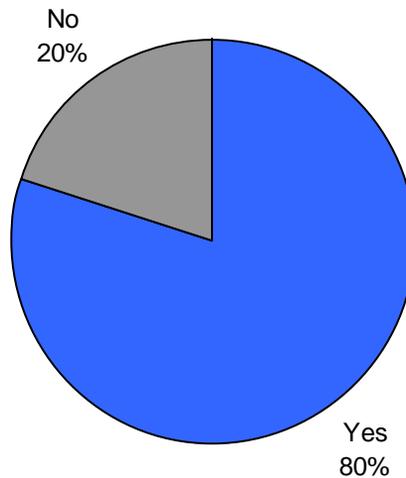


Figure 24. Do SHPOs Share Data with Other Agencies?

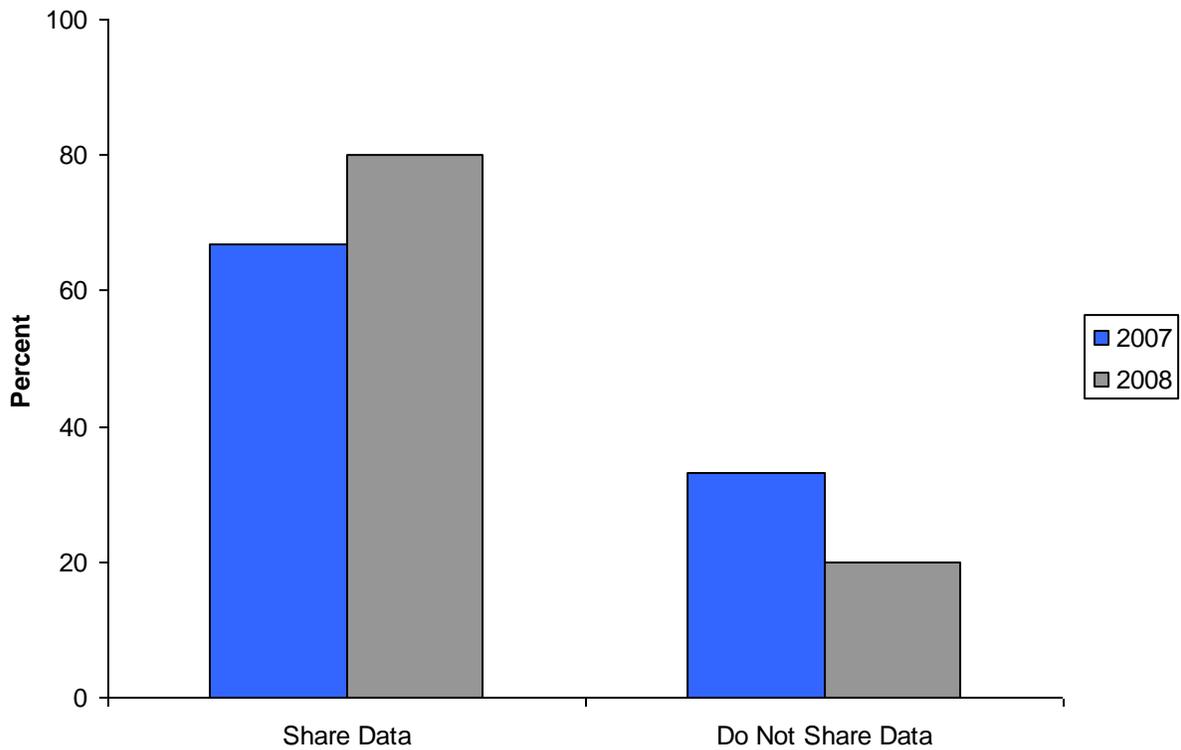


Figure 25. Comparison of 2007 and 2008 SHPO Data Sharing Practices

Data Hosting

Questions: What types of information do you host on the internet? Database; images; GIS; other.

If other, please explain.

If your electronic databases are not available via the internet, what has prevented you from making such data available?

Which data sets are available to the public?

What data sets are restricted via password protection, subscription-based, available only to SHPO?

What types of systems are in place to insure protection of restricted data?

Do you charge users for accessing data?

Images are the most common type of data hosted on the internet, with databases close behind, followed by GIS information (Figure 26). Of the states that responded that “other” information was hosted on the internet, the most common type of information was a limited GIS dataset or GIS hosted by some other organization. Several states also noted that they hosted National Register forms on the internet. There was a significant increase in the number of states that are hosting information on the internet from the 2007 survey to the 2008 survey (Figure 27).

The top reasons for not hosting information on the internet are that they systems are under development or that such systems are cost prohibitive (Figure 28). Security issues and a lack of staff with technical expertise were also listed as significant barriers to internet development (Figure 28). Only 4 states indicated that none of the SHPO information is available to the public. Historic properties records and National Register forms are the types of data most frequently listed as available to the public. Access to archaeological site data via the internet is generally restricted by password protection. Most SHPOs responded that password protection and user license agreements are the main form of data protection. Only two states indicated that their information systems were protected behind a firewall. A majority of states do not charge for access to their data systems (Figure 29).

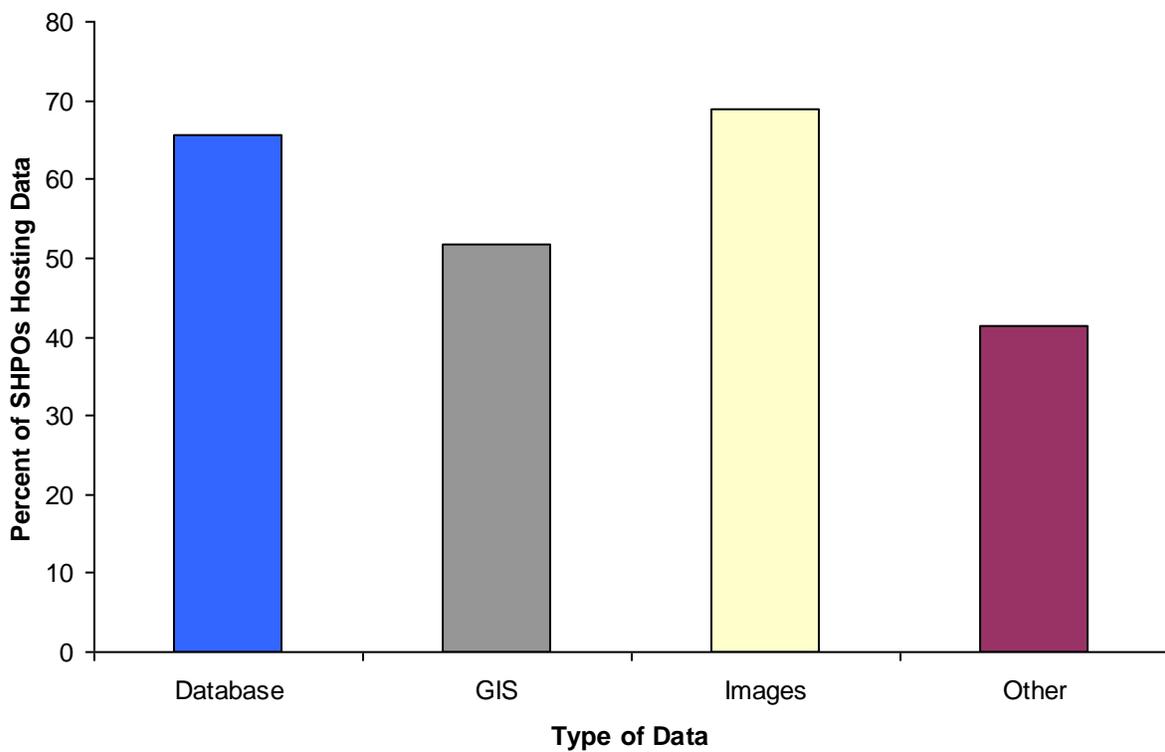


Figure 26. Types of Data Most Commonly Hosted on the Internet

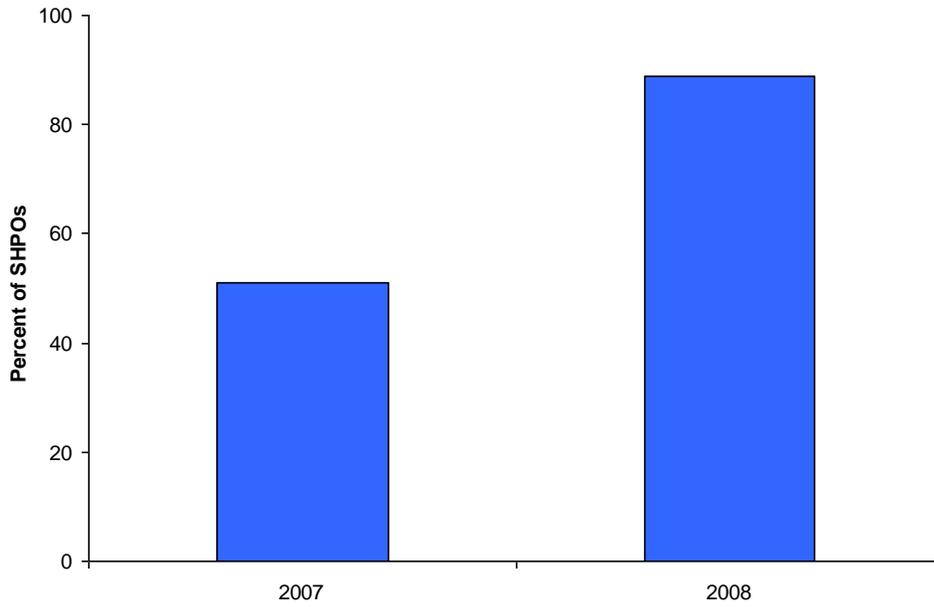


Figure 27. Percent of SHPOs Hosting Information on the Internet

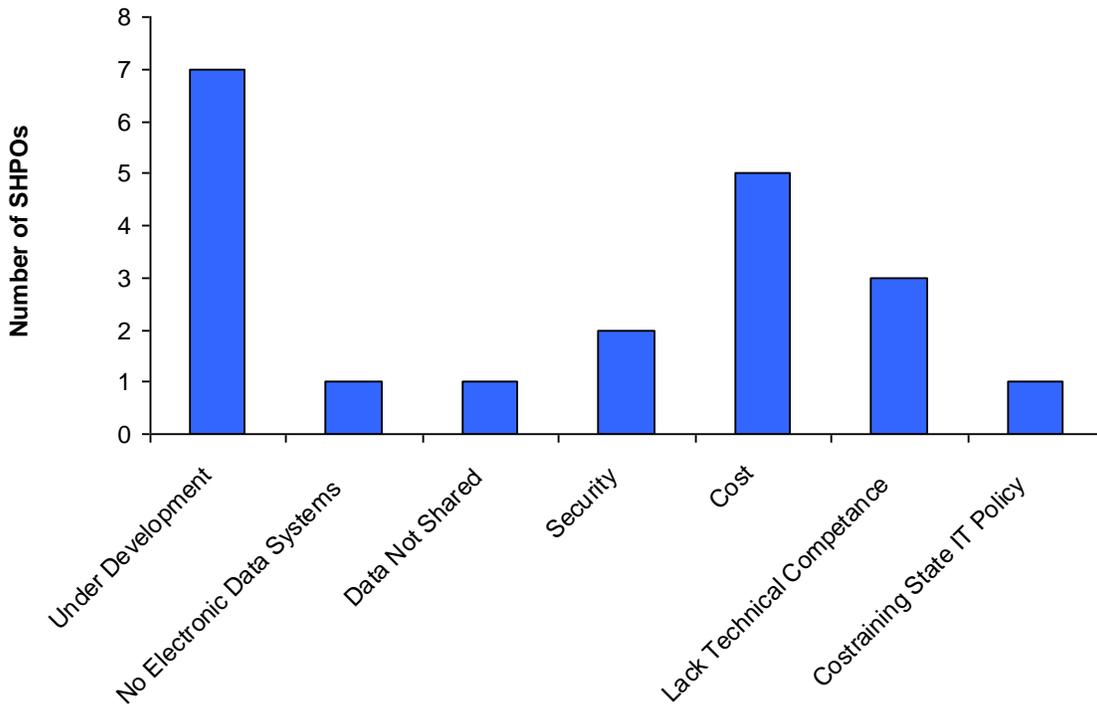


Figure 28. Reasons Data is not Hosted On Internet (some states who are hosting data responded to this question; some states gave multiple reasons and each reason was tallied)

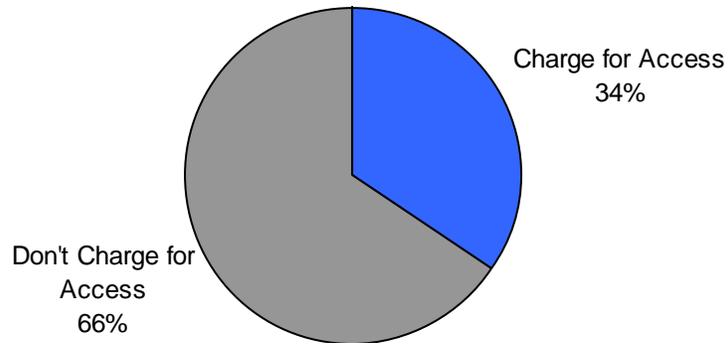


Figure 29. Do SHPOs Charge for Access to Data?

Model Programs

Question: Do you feel you have a system in place in one of the following program areas that could be used as a model that could benefit other SHPOs?

Several states feel that they have model programs in one or more common SHPO tasks that could be exploited to help other SHPO offices (Figure 30). Offices that indicated that they had a model program could be studied to propose best practices for each program.

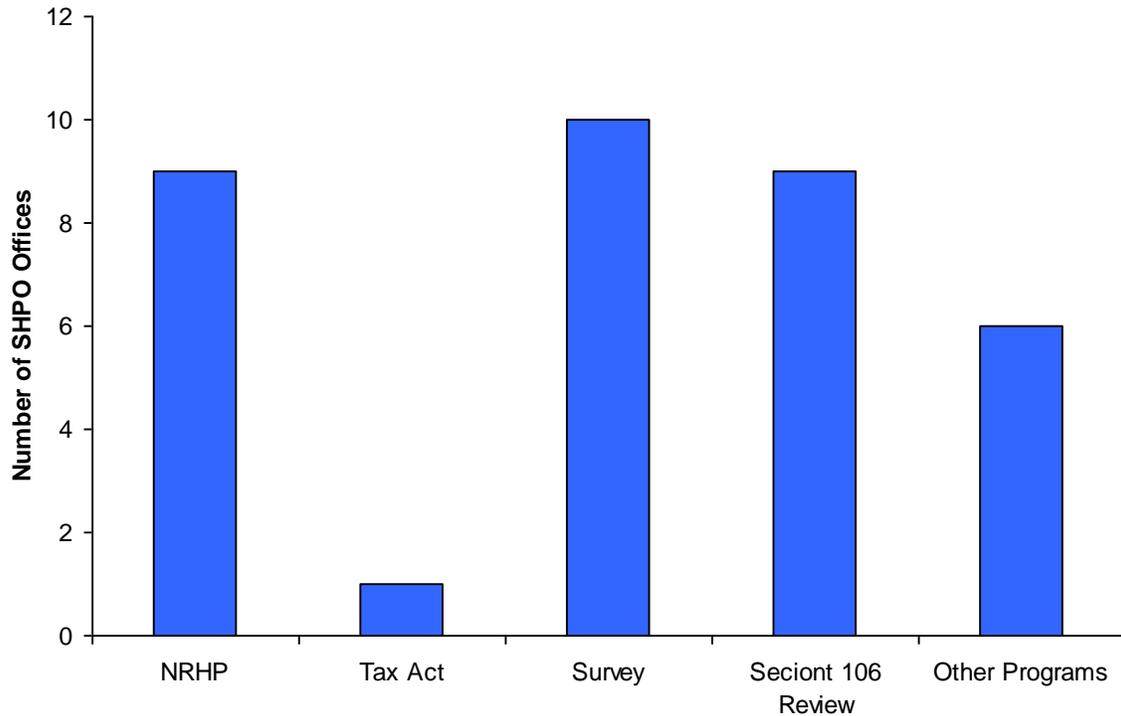


Figure 30. SHPOs with Model Programs

Software and Hardware

Questions:

What types of software do you use? (e.g., MS SQL Server, Oracle, ESRI GIS products)

Are your software choices guided by agency policy?

Is the software customized for your office?

What type of hardware do you use? (e.g., personal computers, servers, both)

What types of operating system do you use? (e.g., Windows Vista, Windows XP)

Are your hardware and operating system choices guided by agency policy?

All respondents indicated that they are using Windows operating software. The dominant operating system is Windows XP. One office has switched to Vista for PC use, while a couple offices are still using Windows 2000 operating systems. 2 offices responded that they are using either UNIX or Linux based servers. All offices doing GIS work except one are doing so using the ESRI suite of GIS software. One office is using Maptitude to do their GIS work. Other common software applications used in SHPOs are Microsoft SQL Server, the Microsoft Office suite of products, and Oracle. A majority of offices are guided by agency policy in the choice of their software (Figure 31) and most office use software that has not had any office-specific modifications (Figure 32). Only one responding state office does not employ servers and the vast majority of state offices are guided in their hardware choices by agency policy (Figure 33). No comparable data is available from the 2007 survey.

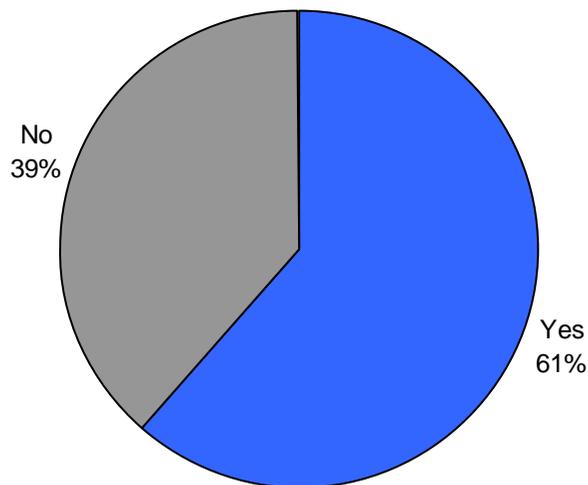


Figure 31. Are SHPO Software Choices Guided by Agency Policy?

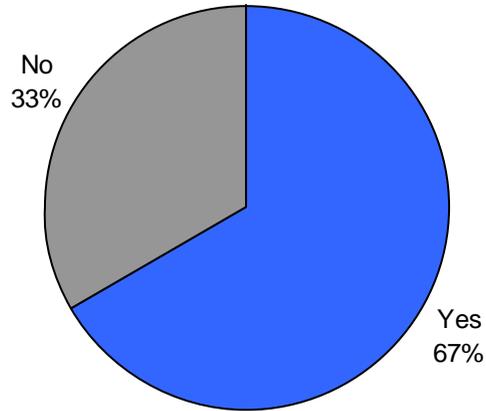


Figure 32. Are SHPO Software Packages Customized by Individual Offices?

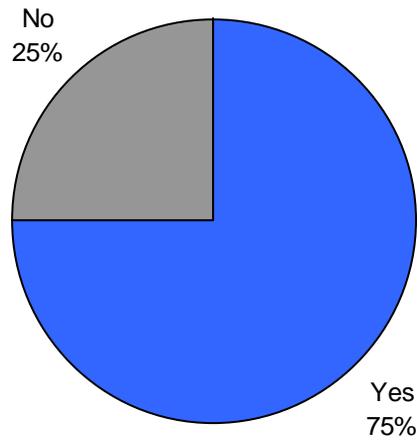


Figure 33. Are SHPO Hardware Choices Guided by Agency Policy?

Data Backlog

Question:

Estimate how many months of backlog are waiting to be entered into your electronic data systems? Include old data that needs to be entered and the time it takes to enter new incoming data.

One of the significant challenges to creating comprehensive, reliable, and easily searchable databases is the significant amount of legacy data that must be transformed from hard-copy paper records into digital information. Twenty-eight responding states and territories estimate that it will take a total of more than 66 years to bring their back-logged data into a digital format. This is down significantly from the 2007 survey when there was an estimated 91 years worth of back-logged data. However, this reduction is due to the large number of states that did not participate in the 2008 survey. On average, each SHPO has more than two years worth of back-logged data waiting to be entered into an electronic database (Figure 34). This figure remains basically unchanged from the 2007 survey (Figure 35).

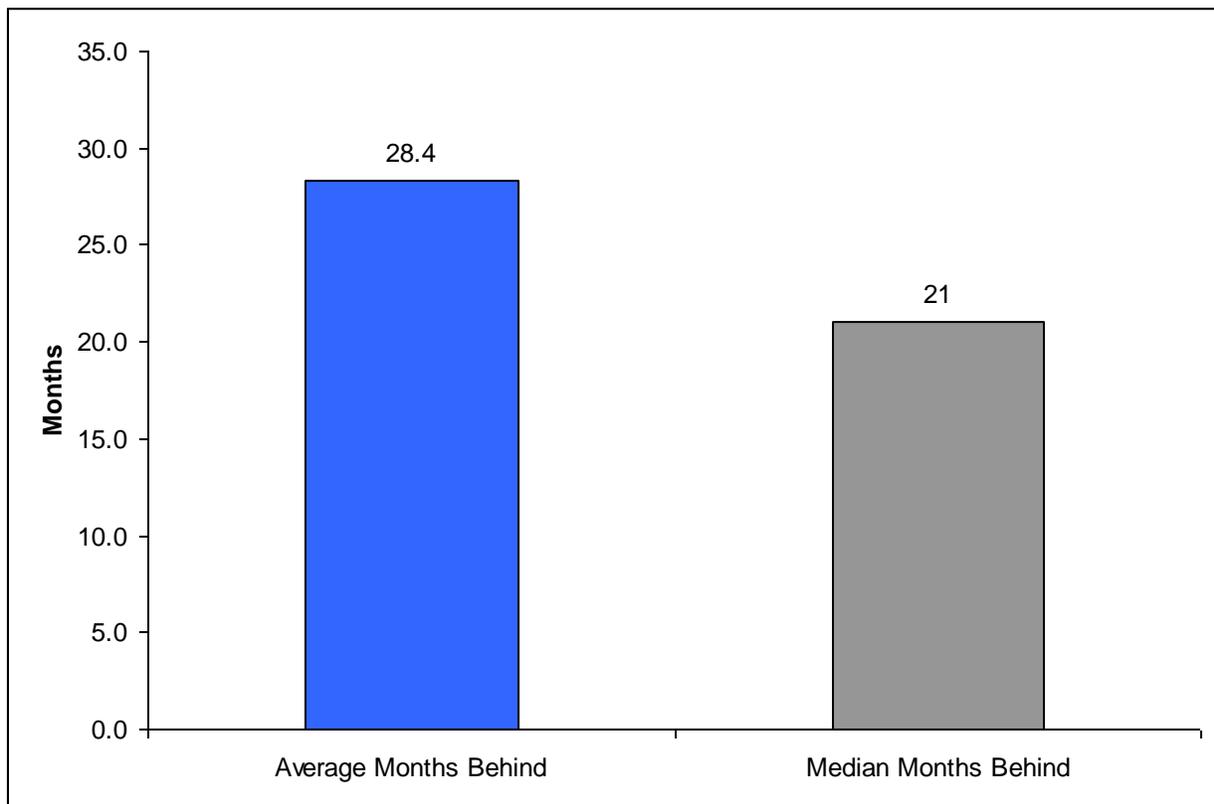


Figure 34. Amount of Back-logged Data Measured in Months

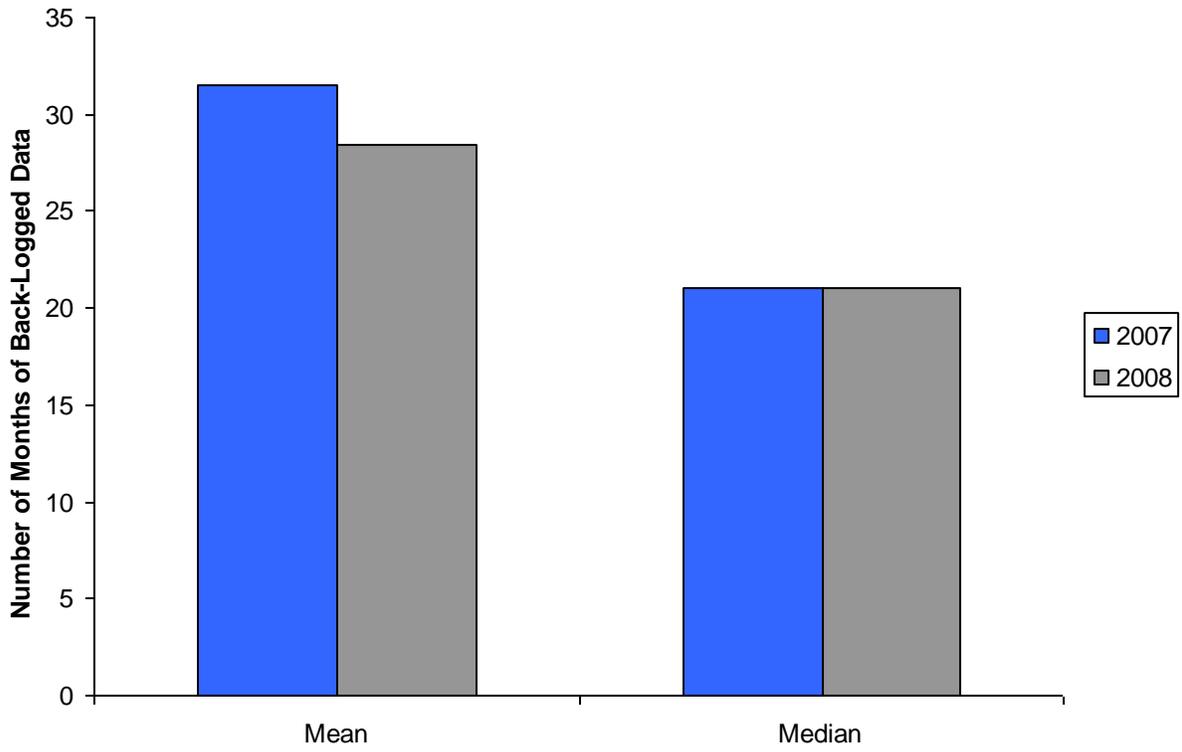


Figure 35. Comparison of Reported Back-log between the 2007 and 2008 Surveys

SHPO Priorities

Question:

What are your top five priorities in technical development? (e.g., database design, GIS design, website development)

SHPOs were asked to list their top 5 priorities. The responses to this question were tallied under 11 headings derived from the open-ended responses supplied by the SHPOs. 32 states provided between 1 and 5 priorities each. The top priority Nationwide is web site design, development, and implementation (Figure 36). This is followed closely by database and GIS design and development. Often, the GIS and database are design and development is paired with web development in attempts to allow access to these data via the internet. It is likely that these results were skewed by the wording of the question which suggested database design, GIS design, and website development as possible answers to this question. Other top priorities include technology upgrades, document imaging, and data entry or back-logged data entry. No comparable data is available from the 2007 survey.

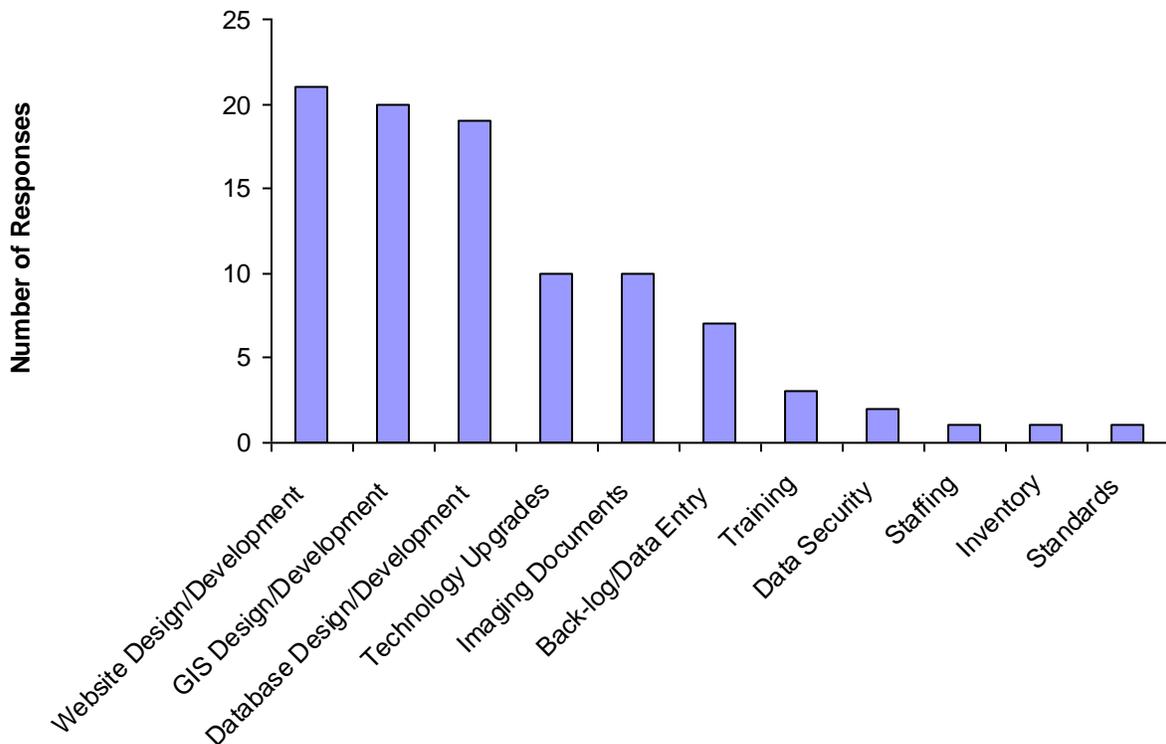


Figure 36. Top SHPO Priorities

Other Comments

Question:

Any additional comments or topics we should address?

Many comments were simply directed at clarifying a specific answer to a question in the survey. However, there were a few comments directed specifically at the question regarding development of a core data model. Alabama and Michigan stated that the development of data and metadata standards are critical, while Massachusetts and North Dakota stressed the need to take into consideration the significant investments of time and money they have put into existing data systems before imposing a schema upon SHPOs.

Appendix A: Nationwide Data Collected for the 2008 Data Management Survey