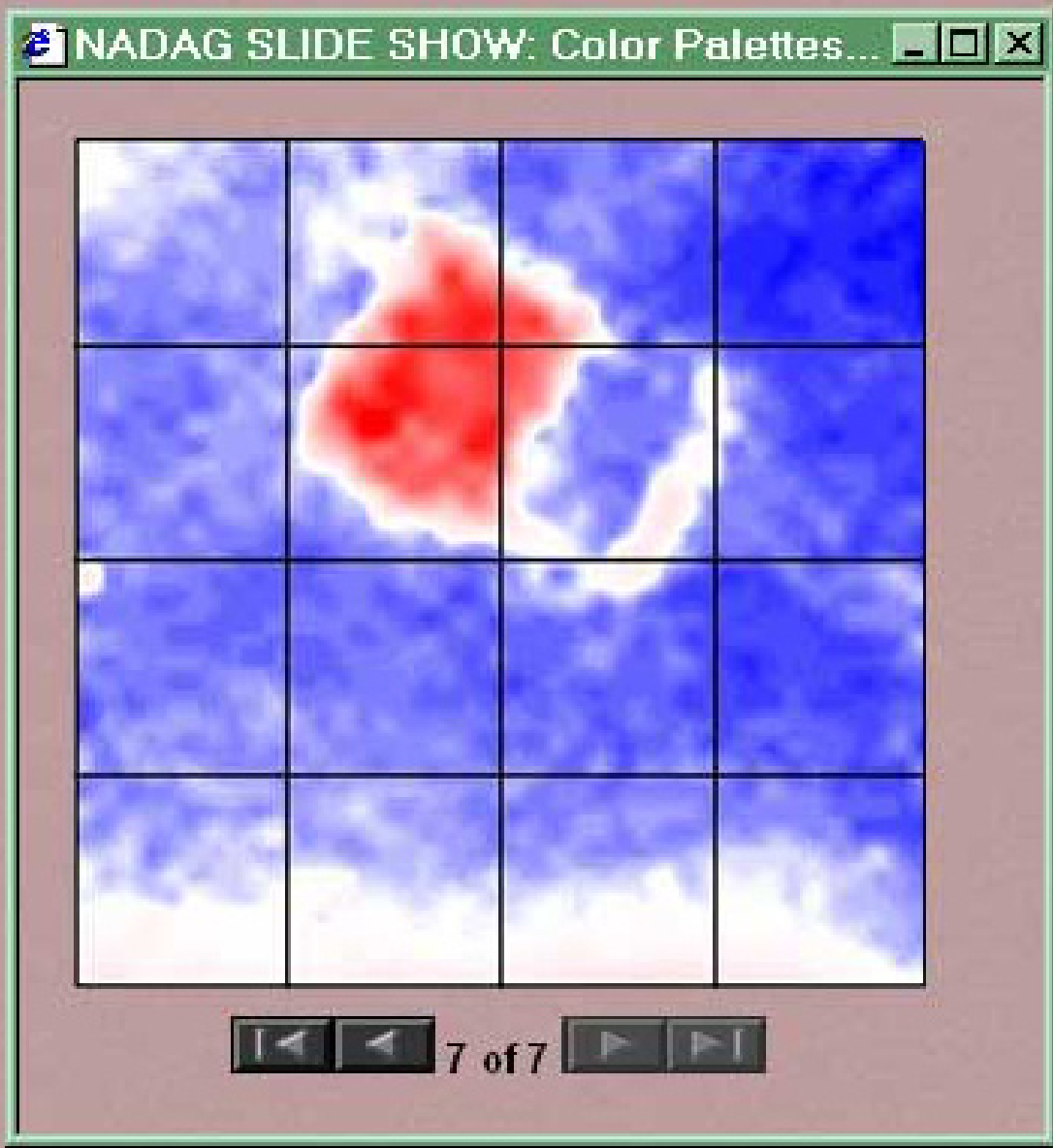




The North American Database and Website of Archaeological Geophysics (NADAG), Year 2 | 2002-02

University of Arkansas



Final Project Report



The North American Database and Website of Archaeological Geophysics (NADAG), Year 2

<http://www.cast.uark.edu/nadag>

Prepared by:

Kenneth L. Kvamme, Principal Investigator

Department of Anthropology and Center for Advanced Spatial Technologies

Old Main 330, University of Arkansas, Fayetteville, AR 72701

(501) 575-4130; kkvamme@uark.edu

Prepared for:

National Center for Preservation Technology and Training

United States Department of the Interior

National Park Service

Funded by:

Grant Agreement No: MT-2210-0-NC-18

December, 2001

Funding for this report was provided by the National Park Service's National Center for Preservation Technology and Training. NCPTT promotes and enhances the preservation of prehistoric and historic resources in the United States for present and future generations through the advancement and dissemination of preservation technology and training.

NCPTT's Preservation Technology and Training Grants program develops partners in non-profit organizations, universities and government agencies throughout the United States to complete critical research, training, and information management work, and lends significant support to developments in the conservation and preservation community.

This report was developed with funds from the Preservation Technology and Training Grants program. Its contents are solely the responsibility of the author and do not necessarily represent the official position or policies of the National Park Service or the National Center for Preservation Technology and Training.



2. Table of Contents

1. Title Page	1
2. Table of Contents	2
3. Executive Summary	3
4. Introduction: Project Background	4
5. Methods and Materials	6
The Structure of NADAG	6
Implementation of Year 2 Project Goals	6
Hardware	7
Software	8
Database Organization and Format	8
6. Results and Discussion	9
Status of NADAG	9
Relevant Statistics	15
7. Conclusions	15
8. Acknowledgements	15
9. References	16



3. Executive Summary

The *North American Database of Archaeological Geophysics* (NADAG) is a database and website that aims to promote use, education, communication, and knowledge of archaeological geophysics in North America. It is maintained by the Center for Advanced Spatial Technologies (CAST) at the University of Arkansas at: <http://www.cast.uark.edu/nadag>. Most North American archaeologists have little knowledge of geophysical methods or of their large potential to archaeology, and their level of use in projects remains low. The NADAG project aims to elevate awareness of these methods.

NADAG contains a number of components pertaining to archaeological geophysics in North America and around the globe. (1) *The NADAG Home Page* lists project sponsors and gives access to the site's components through menus. (2) *The About NADAG Page* summarizes the site's components and intent. (3) *The Image Library* focuses on geophysical imagery depicting project results. (4) *The Projects Database* contains more detailed information about projects and is searchable by multiple fields of information. (5) *The Bibliography Database* references technical reports, many annotated, describing archaeo-geophysical work in North America, and method and theory works of general interest. (6) *Education Materials* includes topics pertaining to geophysical methods, theory, field practice, and data processing. (7) *The Instrumentation Database* describes geophysical instrumentation and provides links to manufacturers' websites. (8) *The Practitioners and Consultants directory* provides a listing of consultants and companies active in archaeo-geophysics, with addresses and links to their websites. (9) *The Upcoming Events* page lists relevant conferences, workshops, and meetings. (10) *The Links to Other Websites* provides a ready means for examination of other nationally sponsored websites, as well as corporate and private offerings pertaining to archaeo-geophysics.

This final project report describes work undertaken in NADAG within year 2 of the project, which specifically focused on (1) increasing the number of geophysical studies held within the databases, (2) annotating bibliographic citations, (3) enhancing educational materials offered, and (4) promoting links to NADAG worldwide. The state of the NADAG databases and website as it currently exists is summarized, with (1) more than 300 geophysical studies, (2) more than 1,500 bibliographic citations (of which more than 300 are annotated), (3) more than 50 pages of educational materials, and (4) a good level of use of the site, with about 4,100 hits averaging about a dozen per day. The Principal Investigator and CAST plan to continue expansion and maintenance of this website.

4. Introduction: Project Background

The *North American Database of Archaeological Geophysics* (NADAG) is a database and website that aims to promote use, education, communication, and a knowledge base of the practice of archaeological geophysics in North America. The scope of NADAG includes all projects conducted within the territories of the United States or within the continent of North America. It is located at <http://www.cast.uark.edu/nadag>. The impetus behind the development of NADAG rested in a three-fold perspective that recognized significant improvements in the technologies in recent years, the great benefits to archaeology derived from the use of these methods, and a realization of a low level of awareness of geophysical methods among North American archaeologists.

Geophysical prospecting methods are growing in importance to the conduct of archaeology around the globe. One reason lies in major advances in instrumentation that have increased speed and sensitivity; another is computerization. Digitally-gathered field data may be downloaded to computers where digital image processing methods filter out noise and regional trends, enhance linear features, improve contrast, and reveal subtle details previously difficult to visualize. The consequences of these advances are profound: (1) larger areas may be geophysically surveyed in a given amount of time, and surveys of large areas facilitate interpretation of settlement layouts and structure owing to the greater possibility of associations between features and the realization of context; (2) regions may be sampled more intensively allowing greater feature resolution; (3) superior details of subsurface features and depth penetration may be achieved; (4) output may be expressed as imagery that is more readily interpretable to the specialist and non-specialist alike (a buried house foundation can look like one in processed geophysical imagery).

A principal benefit of geophysical survey methods is that they provide cost-effective means for the acquisition of archaeological information relevant to multiple domains of inquiry. For example, management and planning maps of archaeological sites can be created that document their basic subsurface structure and the layout of features. The placement of expensive excavations and testing programs can be guided to features of potentially greater interest, producing large cost savings in site explorations. Primary data for settlement pattern research and analysis can be obtained when details of a site are clearly mapped. In other words, geophysical results can provide detailed maps of complete settlement layouts, showing the distribution and arrangements of houses within a village, lanes between them, fortifications systems, privies, graves, ditches, pits, middens, and the like. Within houses, individual rooms and features within them like hearths may sometimes be discerned. Finally, non-invasive examination of culturally sensitive burial, sacred, or ceremonial sites can be achieved, a fact that is increasingly noteworthy to Native American groups. The Winebago Tribe of Wisconsin, for example, has trained a team in the use of ground penetrating radar as a means to locate graves and other features left by their ancestors.

Despite these advances and benefits the level of use of geophysics in North America remains low in comparison to Europe and Japan. In the United Kingdom, for example, geophysical surveys are mandated as a first step in the site evaluation process, and the mapped results constitute an important management and planning record in a site's official

documentation. Moreover, several national archaeo-geophysical websites and databases are in place in Europe, including English Heritage (<http://www.eng-h.gov.uk/SDB>) and Austria's "Archive of Geophysical Data" (<http://www.univie.ac.at/Projekte/Idea/Prosp/Surveys/>), and others. In the UK the use of these methods is so commonplace that they have attracted popular attention through a weekly television show known as "The Time Team," where geophysical surveys are conducted and then followed up immediately with excavation to verify or refute findings. Given the popularity of this show (it has been aired for several seasons), it would not be wrong to speculate that the British lay public is probably more aware of geophysical methods than professional North American archaeologists.

The primary purpose of NADAG is to rectify this situation through education, by making the results of geophysical work available, and providing a gateway to practitioners, manufacturers, and the resources they offer. It is emphasized that significant increases and reliance on geophysical methods are being made in North America. The US National Park Service has sponsored a week-long workshop in remote sensing for 10 years with an average attendance of about 40 participants, resulting in significant exposure of these methods to primarily government archaeologists, but also contractors, academics, and students. The number of practitioners is increasing and there is greatly increased demand for their services.

NADAG is being developed by the "ArcheoImaging Lab," a laboratory within the Department of Anthropology managed by Kenneth L. Kvamme, the project's Principal Investigator and Associate Professor within the department. A graduate assistant, Jenny Bales, aided in the development of the project during the 2000-2001 academic year. The website server, supporting software, and database engine are managed and supported by the Center for Advanced Spatial Technologies (CAST) at the University of Arkansas. CAST supports a large staff of technicians and programmers who have assisted in database creation and interfacing.

NADAG was initially proposed to NCPTT as a three-year project. As originally conceived *year 1* was to establish the initial structure of the database and website, with input into the database of local geophysical surveys in Arkansas, projects conducted nationally by the principal investigator, and particularly the entry of at least 400 bibliographic citations. These tasks were successfully accomplished (Kvamme 2000). *Year 2* focused on increasing educational materials to at least 50 pages, growth of the database to include at least 300 geophysical studies, and annotation of at least 300 geophysical publications. The meeting of these tasks is described in this report. *Year 3* was to concentrate on continued growth and participation in the database, with improved educational materials for grades 6-12 and expansion into related remote sensing domains, but funding has been terminated owing to general budget cuts within the NCPTT and these tasks are no longer planned.

This report is a final project report that documents the total achievement of the NADAG project and particularly progress made during year 2. Owing to the substantial nature and quality of NADAG, a belief in its mission, and its growing popularity, the Principal Investigator, the Archeo-Imaging Lab, and CAST are committed to its continuance. NADAG will be maintained and continue to expand through the Principal Investigator's efforts, use of University of Arkansas work-study monies, volunteerism by graduate students, submissions of materials by practitioners, and other means.

5. Methods and Materials

The Structure of NADAG

NADAG as originally proposed was to contain several components pertaining to archaeological geophysics in North America and around the globe. This concept was carried out in its implementation. NADAG now contains 11 principal sections, each devoted to a different theme, as follows.

1. *The NADAG Home Page* lists project sponsors and gives access to the site's components through menus.
2. *The About NADAG Page* summarizes the site's components and intent.
3. *The Image Library* focuses on geophysical imagery depicting project results.
4. *The Projects Database* contains more detailed information about projects and is searchable by multiple fields of information.
5. *The Bibliography Database* references technical reports, many annotated, describing archaeo-geophysical work in North America, and method and theory works of general interest.
6. *Education Materials* includes topics pertaining to geophysical methods, theory, field practice, and data processing.
7. *The Instrumentation Database* describes geophysical instrumentation and provides links to manufacturers' websites.
8. *The Practitioners and Consultants directory* provides a listing of consultants and companies active in archaeo-geophysics, with addresses and links to their websites.
9. *The Upcoming Events* page lists relevant conferences, workshops, and meetings.
10. *The Links to Other Websites* provides a ready means for examination of other nationally sponsored websites, as well as corporate and private offerings pertaining to archaeo-geophysics.
11. *Contacts and Submissions* allows the viewer to directly contact NADAG personnel.

Implementation of Year 2 Project Goals

The overall objective of Year 2 of the NADAG project was to enhance the basic database and web site by populating it with information on more projects, including bibliographic annotations, creating significant educational materials, and encouraging use of and links to NADAG.

- *Additional projects* were entered into the database, now amounting to over 315 individual studies. These projects were obtained by writing, telephoning, or e-mailing individual practitioners. This proved to be the most difficult undertaking, which was not anticipated. At present many of the practitioners of archaeo-geophysics are simply too busy to take the time to send reports by mail or electronically. Many were also concerned that information prepared for clients may be proprietary, and were therefore reluctant to share the material without going through a process of securing permissions, an added burden they were unwilling to do. Many colleagues and several government agencies were able to provide materials, however, and projects were also obtained from published literature. The use of materials from published articles (abstracts, illustrations)



generally required securing of copyright permissions from the publishers, frequently a difficult undertaking (see the following).

- *Bibliographic annotations* were created by using abstracts or summaries from reports within the *Projects Database*, and from published literature. For the latter, several dozen letters were written to the editors of journals to secure permission to include copyrighted abstracts within NADAG. This was an extremely laborious process and a time consuming one, for in some cases several letters had to be written to editors and publishers to explain exactly what we wanted. About half of the time this permission was either refused or significant fees were requested, and copyright fees were not budgeted in the project. In this case the NADAG staff composed new abstracts by reviewing the articles, also a time-consuming process. Over 300 articles or reports are currently annotated.
- *Educational materials* were developed based on the Principal Investigator's class materials at the University of Arkansas and project experience, and through materials donated by colleagues. Dr. Larry Conyers of the University of Denver, Dr. Rinita Dalan or Moorhead State University, and Dr. Bruce Bevan of Geosight (Weems, Virginia) allowed NADAG to use educational materials they have prepared. Over 57 pages currently exist within the educational section of NADAG.
- *Links and Use of NADAG* was encouraged in several ways.
 - E-mailing other archaeological, anthropological, or geophysical websites was performed to urge linkage to NADAG;
 - The *SAA Archaeological Records* (March, 2001) contained an article by Meg Watters, archaeologist with Geophysical Survey Systems, Inc, entitled: "Another Tool for the Kit," which gave a strong endorsement of NADAG;
 - New updated NADAG brochures (see Appendix) were mailed to 100 departments of Anthropology;
 - An article about the NADAG project has also appeared as a University of Arkansas Press Release entitled "University of Arkansas Researcher Develops On-Line Archeology," by Allison Hogge, dated October 27, 2000
 - Brochures were distributed at several conferences and workshops:
 1. *Joint Plains-Midwest Anthropological Conference* in St. Paul, (November, 2000);
 2. *Society for American Archaeology* meeting, in New Orleans, April;
 3. *Canadian Archaeological Association* meeting, May;
 4. *National Park Service-sponsored workshop* "Recent Advances in Archaeological Prospection Techniques," in Chillicothe, Ohio, May.
 5. *Plains Anthropological Conference* in Lincoln, November;
 6. *Ground Penetrating Radar Workshop*, sponsored by NCPTT, in Fayetteville, November.

Hardware

NADAG was developed utilizing a variety of hardware devices. The primary work is conducted on two Windows NT 4 workstations running on Dell Pentium 3 computers with significant RAM and disk space. Peripheral devices include an optical scanner (with up to 1200 dpi resolution), a 36 x 48" coordinate digitizer, a variety of color and black-and-white output devices, and a digital camera. The scanner, digitizer, and digital camera are employed to acquire

graphics from submitted reports or from field contexts. The various printers have been used to develop brochures, fliers, and notices for mailings. NADAG is managed by CAST, at the University of Arkansas, on a SUN Ultra Enterprise 5000 with four UltraSparc CPUs, one GB RAM, and 600 GB disk space, running Solaris 2.6. The web server is the Netscape Enterprise System. With DS3 (145 M/sec) connectivity to internet and internet2, these systems can support many hundreds of concurrent users.

Software

NADAG was constructed utilizing a variety of software systems and components within the Windows NT 4.0 environment. Individual HTML files have been composed utilizing diverse programs ranging from simple ASCII editors like Notepad, to MS Word conversions, and Netscape Composer. Midway through the project the decision was made to move to Macromedia's Dreamweaver 3 environment (Macromedia, Inc., 1999a) for all composition and management of the website. A mirror image of the website is located on the NT4 platforms; FTP is used to place new and updated materials onto the Unix-powered website.

A number of graphics formats are recognized within NADAG, including continuous tone color, continuous tone gray scale, contour line, dot density plots, pseudo-three-dimensional views, and various combinations between them. Graphics files are generated in a number of ways. Graphical materials obtained through reports are typically scanned at resolutions varying from 75–150 dpi, most often in gray scale for black and white copies or in 24-bit color for rare color plates. Some graphics data have been obtained digitally in graphics file formats (TIF, BMP, JPG, GIF), as well as in more specialized software formats commonly employed in geophysical work, such as GSSI's RADAN (Geophysical Survey Systems, Inc., 1998), Geoscan's GEOPLOT (Geoscan Research, 2000), or Golden Software's SURFER formats (Golden Software, Inc., 1997). Regardless of how data are obtained, graphics files are imported to Adobe Photoshop (Adobe Systems, Inc., 1999) or Macromedia Fireworks (Macromedia, Inc., 1999b) where enhancements to quality are made, color tints are added (for gray scale formats), size adjustments are undertaken, and file compression is applied to reduce file size for more rapid downloads over the internet. In all cases continuously-varying imagery are converted to the JPG standard while line-drawn and choropleth-style materials are coded using the GIF standard, for minimum file sizes. All graphics icons depicting imagery (e.g., in the *Image Library*) are produced as 64 x 64 pixel squares, while other graphics typically are generated at sizes smaller than 500 x 500 pixels, with a target file size of less than 50 KB whenever possible. For larger imagery containing more detail an upper maximum of about 90 KB is targeted. The sizes of files are a principal concern owing to download times required using telephone line and modem technology.

Database Organization and Format

NADAG is composed in a series of databases. The principal ones are the "Image Library," the "Projects Database," and the "Bibliography," but small databases also exist to form other sections like "Instruments and Manufacturers," "Links to Related Websites," "or even "Practitioners and Consultants." In each case the individual database entries have been placed within HTML files that are then linked to allow pre-defined search capabilities. Users are able to search by location (state / province), by survey technique (e.g., magnetometry, radar), by archaeological site type, site name, or site number, for example. In other words a series of pre-



defined search criteria have been established and hot-linked within a large number of pre-sorted HTML files to allow NADAG to have relatively flexible search capabilities.

It is emphasized that an elaborate relational database structure was initially established for NADAG using Oracle 8 software (Curtis and King 1998), with a series of linked database tables (e.g., separate tables for Survey Methods, Cultures, Site Types, Location data, Addresses, Bibliographic materials, etc.; see Kvamme 2000). This scheme has been placed on a temporary hold for several reasons. The complexity of the information required for presentation, including graphics, makes web-programming with database linkages non-trivial. Software and hardware constantly evolve, with nearly yearly upgrades and dramatic changes in hardware and formats. Viewing the long-term maintenance and offering of NADAG as a goal, and the realities of funding, we could not be certain that money would be available for expert consultation to make database-web linkage transitions in the future. The life of NADAG lies in ever-changing University of Arkansas graduate student workers, the limited time of the Principal Investigator, and to materials donated by various practitioners. It is an easy matter for anyone to create HTML pages with relatively little training using standard forms, and to place new entries within pre-sorted HTML lists. This is something that can be contemplated with limited time, effort, resources, and personnel with limited programming experience. It is not easy to work with new software revisions in Oracle database engines and web linkage software if one does not do so all of the time. The strategy, therefore, is to continue to produce NADAG as an HTML-based offering with limited search capabilities. We have also decided, however, to undertake a limited trial of the use of the Oracle 8 database engine, to explore just what the difficulties and transitions might actually be.

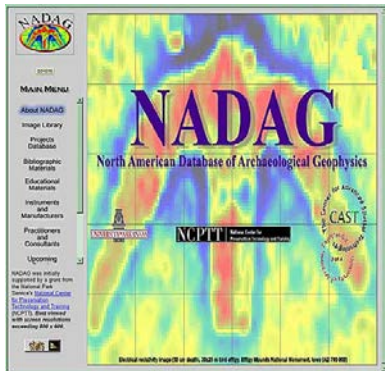
The “Bibliography” section of NADAG allows a search capability through Oracle 8. This search is much more flexible than the more limited number of search types allowed by the pre-established HTML searches. It allows search by bibliographic reference type, author, title, journal, year, culture type, geophysical survey type, location, and archaeological site type, for example. Abstracts/summaries are also included in this database, which at present is relatively incomplete compared to the holdings within the HTML files. Macromedia’s Dreamweaver UltraDev software (Macromedia, Inc., 2000) is the system employed that allows linking of the searchable database to this NADAG page.

6. Results and Discussion

The Status of NADAG

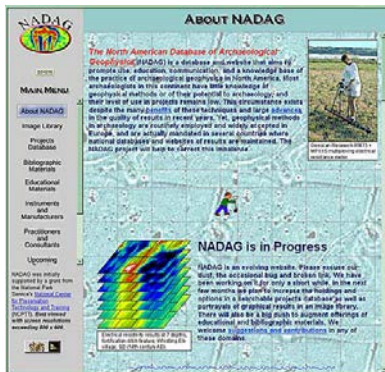
The current status of NADAG, including the accomplishments achieved in year 2 of the project, is summarized according to each of its principal components.

1. NADAG Home Page



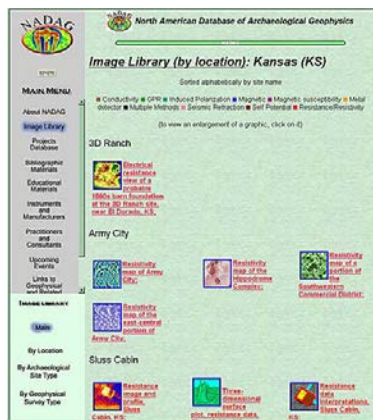
The *Home Page* lists the project sponsors and offers a gateway to the site's components through a series of menus. It also displays the NADAG logo, a resistivity image of a bird effigy from Effigy Mounds National Monument, Iowa. Visitation statistics are also offered through Aaddzz (<http://www.aaddzz.com/>).

2. About NADAG



The *About NADAG* page lists the reasons for the website, its components and sponsors. It contains two primary links to separate pages describing the benefits of using geophysical sensing in archaeology and recent advances in geophysical prospecting technology, along with more generalized links to other components of the site, CAST, other CAST databases, and contacts to the NADAG developers.

3. Image Library



The intent of the Image Library is to interest viewers in archaeo-geophysics by indicating its capabilities, through the presentation of project imagery. The Image Library focuses on thumb-nail (64 x 64 pixel) images depicting project results; clicking on a thumb-nail reveals larger imagery with bibliographic citations indicating their source. The Image Library is searchable by location (state/country), by archaeological site type, and by geophysical survey type (see 4. *Projects Database*). A total of 452 images are currently offered from 28 states and Puerto Rico,

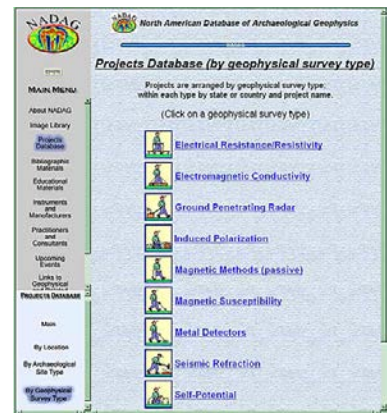
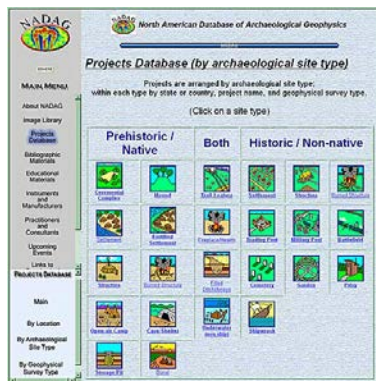
with nine geophysical methods represented. Within each state icons and text are color-coded by geophysical survey type.

4. Projects Database



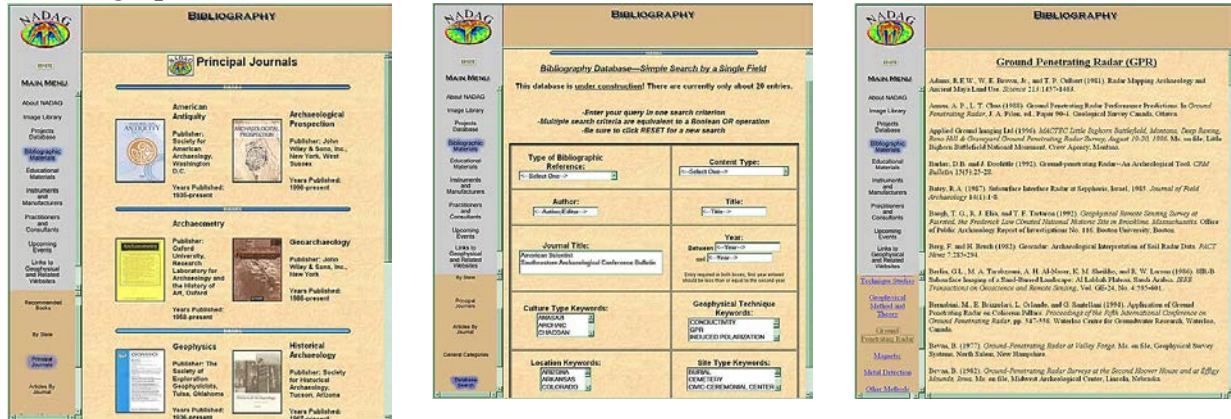
The *Projects Database* contains detailed information about individual archaeo-geophysical projects. Each project offers data about five basic categories of information: location, culture/period, geophysical survey parameters, reporting information, and an abstract or summary.

- *Location* data include: site name, number, county, state, country, ownership, and landform;
- *Culture/period* data include: date of site, period type, culture, site type, site size;
- *Geophysical* survey parameters include for each survey conducted: instrument, sampling interval, prospecting depth, area surveyed, date of survey, land cover type, ground truthing;
- *Reporting information* includes: project name, references, survey by, survey for, report location;
- The *abstract/summary* includes: project name, reference, and the abstract/summary. When abstracts are not given in a report, or when copyright permissions are not secured, an abstract or summary is written by the NADAG staff.



The Projects database directs the user to individual geophysical studies. It is searchable by site name, site number, type of geophysical survey, type of archaeological site, or by location (state or country). Data from 32 of the United States, Puerto Rico, Mexico, and Canada are currently included. These data include 315 distinct geophysical studies distributed within 153 archaeological sites.

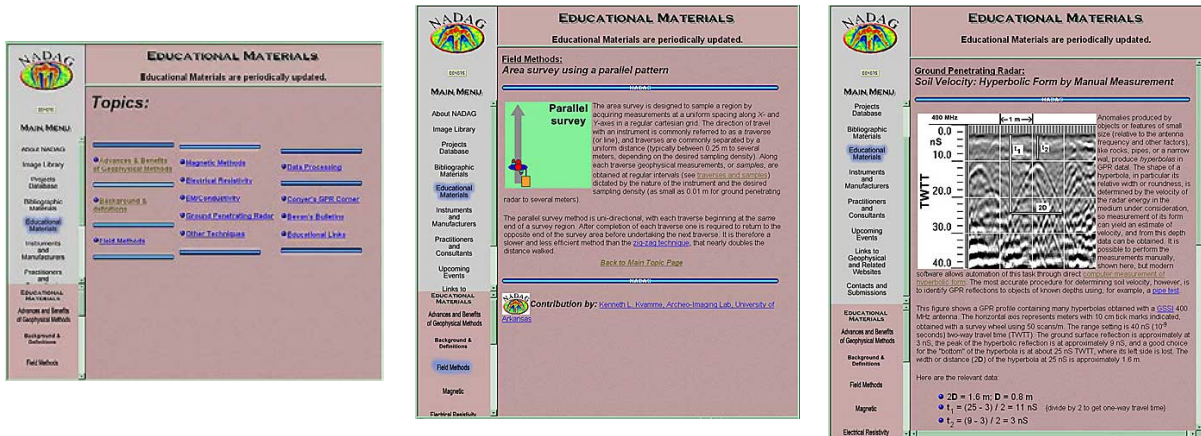
5. Bibliographic Materials



The *Bibliographic Materials* section is divided into sections containing a total of over 1,500 citations. More than 300 are currently annotated. Annotated references are high-lighted; clicking on them goes directly to an *Abstract/Summary* page for that article. The bibliographic materials are organized into several sections that allow quick searches to be made. An Oracle 8 search engine also allows user-directed queries, many of which include article abstracts or summaries. The bibliographic materials are subdivided as follows:

- “Recommended Books” (20 entries, annotated);
- “By state” (presently only United States data exist in the database), with a total of 352 total entries. Each state is presented on a separate page with 41 states represented.
- “Principal Journals” (10 entries);
- “Articles by Journal” (107 articles in 39 journals);
- General Categories
 - “Data Interpretation / Image Processing” (8 entries);
 - “Electromagnetic Surveying” (46 entries);
 - “General/Multiple Technique Studies” (281 entries);
 - “Geophysical Method and Theory” (60 entries);
 - “Ground Penetrating Radar” (123 entries);
 - “Magnetic Surveys” (307 entries);
 - “Metal Detection” (64 entries);
 - “Other Methods” (57 entries);
 - “Electrical Resistivity” (114 entries);
 - “Underwater Prospection” (55 entries).
- “Database Search” (allows search within Oracle 8 database, pertaining to all citation types).

6. Education Materials

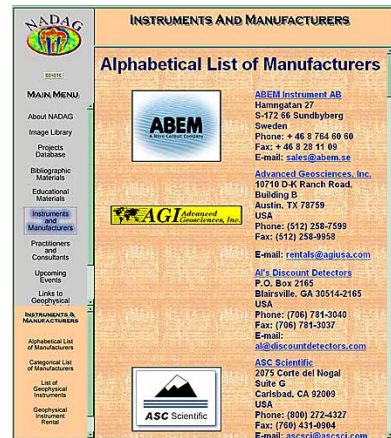


The *Educational Materials* section is designed to give basic and advanced instruction in the various topics of archaeo-geophysics. It makes heavy use of examples and is well illustrated. It also utilizes some of the latest in computer graphics, and web presentation techniques, including slide shows, animations, and image swaps. It is divided into 12 principal topics in 57 individual pages: “Advances and Benefits of Geophysical Methods,” “Background & Definitions,” “Field Methods,” “Magnetic Methods,” “Electrical Resistivity,” “EM/Conductivity,” “Ground Penetrating Radar,” “Other Techniques,” “Data Processing,” “Conyer’s GPR Corner,” “Bevan’s Bulletins,” “Educational Links.”

7. Instruments and Manufacturers

The *Instruments and Manufacturers* page describes geophysical instrumentation and provides links to manufacturers’ websites. It is organized in four sections:

- “Alphabetical List of Manufacturers” (39 links);
- “Categorical List of Manufacturers” (69 total links);
- “List of Geophysical Instruments” (103 total links);
- “Geophysical Instrument Rental” (20 total links).



8. Practitioners and Consultants

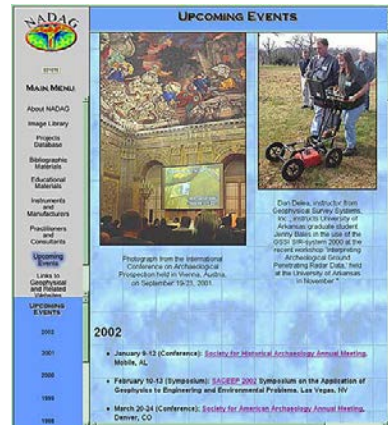
The *Practitioners and Consultants* directory provides a listing of researchers active in archaeo- geophysics, with complete addresses and links to their websites. We are also attempting to include keyword data about the methods and techniques that each practitioner specializes in, and their principal regions of operation. It is organized in two sections:

- “Company/Laboratories” (16 links USA, 1 Canada, 2 Europe).
- “Individual Practitioner/Consultant” (20 links in 16 states).



9. Upcoming Events

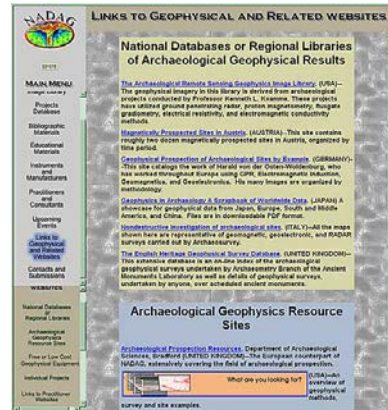
The *Upcoming Events* page focuses primarily on the present (2000-2002), but begins in 1994 with a number of past significant events indicated. The nature of these events includes specialized geophysical conferences, regional conferences that include geophysical presentations, remote sensing training workshops, and scheduled events that utilize these methods. The following shows the number of event links or listed items per year: 1994 (1 link); 1995 (1 link) ; 1996 (1 link); 1997 (2 links); 1998 (2 links); 1999 (3 links); 2000 (13 links); 2001 (24 links); 2002 (12 links thus far).



10. Links to Geophysical and Related Websites

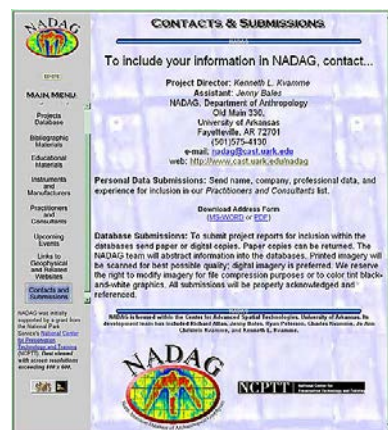
The *Links to Geophysical and Related Websites* pages contain a total of 176 links grouped into several sections:

- “National Databases or Regional Libraries of Archaeological Geophysical Results” (6 links);
- “Archaeological Geophysics Resource Sites” (17 links);
- “Individual Projects” (46 total links), with sub-groups:
 - “United States” (62 links in 30 states);
 - “Europe” (38 links in 11 countries);
 - “Other” (7 links in 6 countries);
- “Practitioners Websites” (10 links in U.S.A., 1 in Mexico, 2 in Europe)
- “Professional Organizations” (8 links);
- “Journals” (17 links);
- “Universities Offering Archaeological Geophysics Training” (5 links);
- “Universities Offering Degrees in Archaeological Geophysics” (4 links, all in Europe);
- “Universities Offering Degrees in the General Field of Geophysics (mostly geology)” (85 links).



11. Contacts and Submissions

The *Contacts and Submissions* page allows the viewer to directly contact NADAG personnel through e-mail or other addresses, to download an address submission form, it gives instructions about how to submit materials to NADAG, and it lists the development team.



Relevant Statistics

- Number of external hits since April 1, 2000: 4075;
- NADAG is composed of 2,283 files, in 146 folders, comprising 40.3 MB, excluding components within ORACLE 8.
- NADAG is composed of 920 HTML files at this point; it contains 1331 graphics images;
- Studies in Projects Database: 315;
- Images in Image Library: 452;
- Bibliographic citations: over 1500;
- Bibliographic annotations: over 300;
- Educational pages: 57.

7. Conclusions

The North American Database of Archaeological Geophysics (NADAG) attempts to provide a resource to practicing archaeo-geophysicists, the larger archaeological community, and the public by making available, through the internet, databases of results and bibliographic citations, educational materials, and pointers to instrument manufacturers and those capable of doing such work. In its first year the basic structure of NADAG was established, with working databases, a bibliography, some basic educational items, and links to numerous other sites of importance to the topic. The second year saw more extensive filling of the databases, annotation of many of the bibliographic citations, the development of extensive educational essays and materials, and numerous new links to related websites from around the world. Steps have been taken to advertise the site, with brochures and presentations have been given at conferences. The current level of about 4,100 hits, averaging about a dozen per day, testifies to a growing interest and use of this website within archaeology.

8. Acknowledgements

I am especially indebted to Jenny Bales, graduate student in the Department of Anthropology, for her contributions in developing the NADAG website during year 2 of the project. I am grateful to the Center for Advanced Spatial Technologies for their continued support and cooperation, and especially to Robert Harris, for assisting with the Oracle database. Charles Kvamme developed a number of the animations in the pages of NADAG, and Jo Ann Christein Kvamme volunteered to input data. Finally, I wish to thank all those archaeo-geophysicists who have thus far contributed to NADAG. Without them this web site would not be possible.

9. References

Adobe Systems, Inc.

1999 *Adobe Photoshop 5.5 User Guide*. Adobe Systems, Inc., USA.

Curtis, Mike, and Jacqueline King

1998 *Oracle 8 and Windows NT Black Book*. The Coriolis Group, Scottsdale, Arizona.

Geophysical Survey Systems, Inc.

1998 *RADAN for Windows NT, Version 2.0, User's Manual*. Geophysical Survey Systems, Inc., North Salem, New Hampshire.

Geoscan Research

2000 *Geoplot Version 3.00 for Windows*. Geoscan Research, Bradford, England.

Golden Software, Inc.

1997 *Surfer for Windows*. Golden Software, Inc., Golden, Colorado.

Kvamme, Kenneth L.

2000 *The North American Database and Website of Archaeological Geophysics (NADAG)*. Final report for 1999 grant award (#MT-2210-9-NC-30) submitted to National Center for Preservation Technology and Training, U.S. National Park Service, Natchitoches, Louisiana.

Macromedia, Inc.

1999a *Macromedia Dreamweaver 3: Using Dreamweaver*. Macromedia, Inc., San Francisco, California.

Macromedia, Inc.

1999b *Macromedia Fireworks 3: Using Fireworks*. Macromedia, Inc., San Francisco, California.

Macromedia, Inc.

2000 *Macromedia Dreamweaver UltraDev: Using Dreamweaver UltraDev*. Macromedia, Inc., San Francisco, California.