



InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems

Case Study Proposal Archaeological Records in a Geographical Information System: Research in the American Southwest Focus 2 - Science

Erin O'Meara
The University of British Columbia

February 2003

Introduction

The idea of this proposal materialized when the correlation between InterPARES and archaeology became very apparent. Both endeavours seek to preserve something that falls into destruction all too easily by the environment, upheaval and development, as well as many other factors. In general terms, *archaeology* is “the study of material objects regardless of time or space in order to describe and explain human behavior and culture.”¹ This case study is first aimed to investigate the nature of records from archaeological activities and what archaeologists think about the records that they create.

The *archaeological site* is the major element to archaeological research. It is “a place where traces of ancient human activity are to be found. It is the archaeologist’s archive.”² A site usually has to have multiple features that are associated, and be at least 50 years old.³ An example of an archaeological site would be if you came across a sleeping ring, next to it a hearth, a pottery sherd scatter, and a grinding stone. If the four aforementioned elements were found in close spatial proximity, they would constitute an archaeological site. Once a site is found, investigation into it can occur.

Another major part of archaeological investigation is context. An artifact loses much of its value without its spatial (position in regards to other objects within the site) and temporal (position within the strata that buries it) context that it possesses in its original position within a site. The concept of the archival bond is very similar to context for archaeologists. Without the organic layers surrounding these artifacts, there is little information to gather from the object. One of the main goals of archaeology is reconstructing culture history, and this cannot be fully accomplished by simply collecting

¹ Jefferson Reid and Stephanie Whittlesey, *The Archaeology of Ancient Arizona* (Tucson: University of Arizona Press, 1997), 277. This focus on material objects regardless of time and space is to reiterate our basis for studying human behaviour through artifacts. This material culture is the essential tool for expressing this behaviour. See also Michael Brian Schiffer, *Technological Perspectives on Behavioral Change* (Tucson, University of Arizona Press, 1992).

² Brian M. Fagan, *Archaeology, A Brief Introduction*, 7th ed. (New Jersey: Prentice Hall, 1999), 49.

³ Once a site reaches 50 years of existence, it is deemed historic and values are attached to it regarding preservation and investigation. The number is a general rule in the United States regarding historic preservation.

artifacts to be put into curio boxes.⁴ The full contextualization of these artifacts is then a major requirement of archaeological investigation, fulfilled through exhaustive documentation of the context of the artifacts, written records and photographs.

Some American archaeology programs adhere to what is called a *four-field approach* to anthropology that requires a student of archaeology to also learn the theory and history of the other sub-disciplines of anthropology, which include physical anthropology, cultural anthropology, and linguistic anthropology. This provides the anthropologist with a holistic and interdisciplinary approach to their chosen field. This four-field approach then gets away from delineating research as being “old” or “ancient,” and also leaves the notion of only studying the “other” and allows us to look at ourselves or our identity and its relationships in an archaeological perspective.

How is it undertaken (processes, vocabulary...)?

One of the main tenets of the archaeological profession is to preserve a part of every investigation for the future, because one of the main activities is non-renewable destruction.⁵ Digging a site is synonymous with destroying it, so this a main point to reflect on when conducting archaeological excavation. The implication for field schools⁶ and other large archaeological undertakings is that a sampling strategy is usually implemented.⁷ It can be random or systematic, and can save time and resources for the archaeological investigation. Smaller investigations might already have an archaeological site of interest pinpointed and do not need to employ a sampling strategy. Once the area of investigation is set, an archaeological survey is usually conducted. An *archaeological (surface) survey* is a non-ground-penetrating investigation of the land and “establishes the types of activity on the sites, locates major structures, and gathers information on the most densely occupied areas of the site that could be most productive for total or sample excavation.”⁸ During the survey, archaeologists can gather artifacts (collection survey), or just walk the area in transects (usually 20 meters long) locating potential information. Once identified, an archaeological site can be excavated. Excavation is a very complicated process that involves a tremendous amount of labour and organization. During excavation, a grid is imposed over the site while it is dug. This stage of investigation yields an enormous amount of artifacts and other related data that survey along cannot supply.

Cultural Resource Management (CRM) is “the management of the finite sites and other records of the past within a framework of federal, state, tribal, and local records designed to minimize destruction of the material remains of the past.”⁹ The antiquities

⁴ David Hurst Thomas, *Archaeology*, 3rd ed. (Fort Worth: Harcourt Brace, 1998), 16).

⁵ Archaeologists leave a percentage of their investigations for future archaeologists, due to better methodology, and more advanced technology that could be present in the future.

⁶ A field school is the main source of hands-on learning experience for aspiring archaeologists. They are usually conducted in the summer and are directed by experienced archaeologists who maintain a “dig” at an archaeological site. At the dig or after the dig, there is a processing room and a laboratory for analysis of the artifacts found.

⁷ Sampling is a strategy in which archaeologists employ probability in the prediction and further study of archaeological sites. An example is if a research area was very large, an archaeologist would grid off a map of the area and pick arbitrary grids and investigate these random sections of the area.

⁸ Fagan, *Archaeology*, 288.

⁹ Fagan, *Archaeology*, 31.

legislation and National Antiquities and Grave Protection and Repatriation Act (NAGPRA) have made what used to be called *salvage archaeology* a major business in the United States. Before it was called CRM, salvage archaeologists sometimes arrived at locations to dig half-bulldozed archaeological sites at construction areas. Now, under the Arizona Antiquities Act, an archaeological survey and records search has to be conducted to determine the possibility of sites in any construction location that is on public land. The records search is done by looking at maps of known archaeological sites within designated repositories¹⁰ of this information and determining the presence or absence of archaeological remains already documented. The emergence of CRM has boosted the publicity of archaeologists in the press and this has helped educate the public about the position of archaeology in society. Archaeologists' role of being stewards of the land and the cultural heritage within it is also being brought to the public's attention through CRM.

What documentation results from archaeology?

Notes, diagrams, maps, daily journals (most archaeologists are trained to maintain a daily journal that indicates weather, notable events, and day to day life at the site), site records, survey records, monographs, databases, spreadsheets, and output from specialized computer programs (from subfields like dendrochronology, lithic analysis, ceramic analysis, conservation, palynology, zooarchaeology, paleobotany, geographic information systems, statistical analysis in general, and osteology, to name but a few).

The main and most common record resulting from the identification of an archaeological site is called a *site card*. This card indicates the site's recorder, the site name, the locational information, land jurisdiction, a description of the site, its depositional context (is the site exposed, a cave, etc.), the site condition, the site assemblage (what was at the site in the way of artifacts), site features, a site plan, and the site location on a map.

In addition to the site cards that are created, a survey report and annotated version (in Arizona, called a project registration form) are created to supply to the legally designated repository and the owner of the land in question. The survey reports are a less specifically oriented document in comparison to the site cards. The survey report can be a large edited monograph with many chapters and a high level of analysis, or it can be a brief description of the land surveyed, the methods used to do so, and the results of the survey (the indication of any sites found).

Why archaeological records?

Archaeology has a great deal to do with the study of human behaviour, which is a large and important endeavour within the social sciences. Historically, archaeology possesses antiquarian roots.¹¹ "In mainstream Western archaeology there has been a growing awareness of the distinctive qualities of archaeological data and of the need to understand these qualities if archaeology is to provide reliable information about human

¹⁰ Each state has a designated repository (sometimes there are multiple, regional ones) where the archaeologists are required to deposit their site and survey documentation, as well as a report. In Southern Arizona, the designated repository is the Arizona State Museum.

¹¹ Antiquarianism is the study of the artifact in an unscientific and decontextualized manner.

behaviour.”¹² Repatriation, legislation, and rapid, city expansion have increased the production of archaeological records, and their preservation is at stake. Many people are attempting to store these records on unstable and fragile media that need extra attention to avoid losing the record altogether.

What are the applications of Geographic Information Systems to archaeology?

In archaeology, *geographic information systems* are “designed for the manipulation, analysis, storage, capture, retrieval, and display of data that can be referenced to geographic locations. GIS are distinct from traditional database management systems because of this spatial referent.”¹³ GIS have a special fit for archaeologists because most of archaeological data is of a spatial nature, so the GIS can effectively manage archaeological datasets.

In the early 1980’s, archaeology first began using GIS to map out distributions of artifacts on floor surfaces of archaeological sites and with other forms of statistical analysis. GIS was first used within the category of spatial analysis and mapping of archaeological data. One of the more popular and very useful means of GIS application to archaeology is predictive modeling. Predictive modeling can be used to predict site location and distribution of artifacts and people within an area. This tool can be very powerful for cultural resource management, and other more broad resource management projects.¹⁴ This leads into the new field of *Non-site Archaeology*, which approaches archaeology in a distributional sense, rather than a site based mindset.¹⁵ GIS can also be useful to apply a non-site approach to archaeology, and it can also be seen as a great technological advance in conducting archaeological analysis.¹⁶

What are the legal implications of American archaeology, especially in Arizona?

NAGPRA is a federal act that enables the protection of sacred archaeological objects and human remains to be returned to Native Americans who claim these objects.¹⁷ If human remains are found, only a few certified archaeologists can dig them up and transport them to a repository before repatriation. It also protects these sacred objects from unauthorized viewing, use, and storage by securing them before they are returned. Many objects that fall under NAGPRA were dug before it was enacted in the 1990’s and are waiting to be repatriated in museums and other repositories. This situation poses unique records management questions such as once these objects are given back,

¹² Bruce G. Trigger, *A History of Archaeological Thought* (Cambridge: Cambridge University Press, 1989), 357.

¹³ Kenneth L. Kvamme, “Geographic Information Systems in Regional Archaeological Research and Data Management,” in *Advances in Archaeological Method and Theory, Vol. 1*, ed. M. B. Schiffer (Tucson: University of Arizona Press, 1989), 139-203.

¹⁴ K.L. Kvamme, “A View from Across the Water: the North American Experience in Archaeological GIS,” in *Archaeology and Geographic Information Systems*, ed. Gary Lock and Zoran Stancic (London: Taylor and Francis, 1995).

¹⁵ See James I. Ebert, *Distributional Archaeology* (Albuquerque: University of New Mexico Press, 1992).

¹⁶ To see some computer applications in archaeology, look at the website a graduate student by the name of Matt Littler has created www.u.arizona.edu/~mlittler/index.htm.

¹⁷ *Native American Graves Protection and Repatriation Act*, Public Law 101-601—November 6, 1990. The act itself can be viewed at www.cast.uark.edu/other/nps/nagpra/DOCS/lgm003.html. A brief explanation of the Arizona Antiquities Act and other related legislation can be viewed on the Arizona State Museum website at www.statemuseum.arizona.edu/arch/arclaws.shtml.

the only evidence for further research are the paper and photographic records. These records become even more essential for archaeologists because they no longer have the physical artifacts.

What does Desert Archaeology do?

Desert Archaeology, Inc. is a CRM firm that has a sister non-profit organization called the Center for Desert Archaeology (www.cdarc.org/), located in Tucson, Arizona. Desert Archaeology conducts contract archaeological surveys, excavations, site mitigations, and large-scale research designs. The Center for Desert Archaeology conducts research in the American Southwest, such as their archaeological investigation along the San Pedro River in southeastern Arizona. Both organizations produce an array of archaeological records, and they are interested in the possibility of a case study based on their records. Many of what would be considered the originals of reports, survey forms and site cards are sent to the Arizona State Museum (ASM) for permanent storage and further use during records searches, but they do conduct their own research that is not required by law to be sent to ASM.¹⁸ These records are maintained at their offices.

Coalescent Communities in Arizona (A.D. 1200-1540) is one of the Center for Desert Archaeology's current research projects. This project seeks to investigate the movement of native peoples during this time period in portions of the American Southwest. Aggregation is seen in the archaeological record during this time, which means that many agricultural groups relocated into different geographical areas. This resulted in the abandonment of many sites that were once heavily populated. This project seeks to obtain accurate information regarding sites during this period from different archaeological sources. The Center for Desert Archaeology is creating a GIS with this information that is shown in 50 year increments to reveal spatial relocation over time. The GIS can gather this dispersed archaeological information as a tool for organization of the information, checking for the accuracy of site type and location, as well as a tool for deeper analysis into the question of aggregation and dispersion in the area over time. Investigation into the Coalescent Communities project will serve as a preliminary investigation to answer questions about the nature of archaeological records in general, and how the more recent electronic format is changing these ideas.

Researchers interested and/or in support of the proposed InterPARES case study are:

- John Olsen, Head, Department of Anthropology, University of Arizona
- John Olsen will be supportive of this project and will be able to give me visiting student status at the University of Arizona while I am in Tucson conducting the case-study.
- Gary Christopherson, Center for Applied Spatial Analysis, University of Arizona
- Gary Christopherson is an expert in GIS and other forms of spatial analysis. He is in support of this project and can offer advice. He would prefer to incorporate a graduate student in anthropology to be a major contact for me due to his hectic schedule.
- William Doelle, President, Desert Archaeology, Inc., Tucson, Arizona

¹⁸ The majority of the Center for Desert Archaeology's research falls into this category.

- William Doelle is interested in this project, but I do not know his specific level of participation right now.
- Brett Hill, Preservation Archaeologist, Center for Desert Archaeology, Tucson, Arizona
- Brett Hill is the GIS Specialist for the Center for Desert Archaeology. He is very interested in this project and would like to be a participant in this project if it falls in the goals of the larger scope of the Coalescent Communities project.
- Susan Rowley, Curator of Public Archaeology, UBC Museum of Anthropology
- Susan Rowley is in the process of creating a complete electronic database for the Museum of Anthropology at UBC. She is interested in this project and is willing to lend her expertise to this project, if needed.
- Colin Grier, Postdoctoral Fellow, Department of Anthropology and Sociology, University of British Columbia
- Colin Grier was a Ph.D. student with Brett Hill at Arizona State University in Tempe, Arizona. He is a great local archaeological expert that is familiar with archaeology in the American Southwest.

Goals

I would like to investigate how these records at the Center for Desert Archaeology (especially the GIS records) are created, what their disposition is, what happens after disposition, and their corresponding authenticity, accuracy and reliability while going through these processes. I have chosen GIS records because they are interactive digital records that are becoming a more familiar face within the archaeological world. I would also like to find out how the archaeological field defines these terms reliability, accuracy and authenticity, and further how they view the resulting records. The electronic format has changed many archaeologists' concept of a record, and how they manage it. This can affect the qualities of the record. Another point of interest related to the perception of records that I have is how this is related to the concept of memory to archaeologists and the related (human) landscapes and descendants of the areas that archaeologists study.

In particular, I would like to investigate the following InterPARES 2 Questions:

- What types of documents are traditionally made or received and set aside (that is, created) in the course of archaeological activities? For what purposes? What types of electronic documents are currently being created to accomplish those same activities?
- What are the nature and the characteristics of the traditional process of document creation in each activity? Have they been altered by the use of digital technology and, if yes, how?
 - These first two sets of questions are some of the main points upon which to focus for the first part of the research. Once these questions are answered, a more refined and accurate approach to the case study can be performed.
- Does the definition of a record adopted by InterPARES 1 apply to all or part of the documents generated by these processes?

- This is a crucial question regarding the nature of archaeological records and how it is possibly changed by an electronic format.
- What does record reliability mean in the context of archaeological activities? To what extent can the electronic records created in the course of each type of activity be considered reliable and why? What requirements on their form and controls on their creation would make us presume that they are reliable?
- What does record accuracy mean in the context of each activity? To what extent can the electronic records created in the course of each type of activity be considered accurate and why? What controls on their creation would make us presume that these records are accurate?
- What does authenticity mean in the context of each activity? To what extent is the definition of record authenticity adopted by InterPARES 1 relevant to the records resulting from each type of activity and from the use of increasingly complex digital technology?
 - Again, this is somewhat unknown territory that needs exploration regarding what archaeologists consider as a reliable, accurate and authentic record, and how this correlates to the archival concepts of these terms. Once these requirements are established, a mechanism for controlling reliability, accuracy and authenticity can be established for these records.
- On what basis can the records created in the course of each activity be presumed authentic? How, in the absence of such presumption, can their authenticity be verified?
- What technological and intellectual tools would assist creators to generate records that can be authentically preserved over time?
- What legal or moral obligations exist regarding the creation, use and preservation of the records under investigation?
 - Legal, cultural and moral obligations reside over the preservation of many archaeological records. These need to be further explored regarding the Center for Desert Archaeology and their mandate for preservation in these terms.
- What principles should guide the formulation of policies, strategies and standards related to the long-term preservation of those records?
 - This is the main goal for this project. Creating a guide and template for archaeologists using an electronic format for record creation and preservation is hopefully one of the outcomes of this case-study.

Research Team

Principle investigator: Richard Pearce-Moses, Arizona State Library, Archives and Public Records
 Co-investigator: Erin O'Meara

Tentative Timetable

- Design case study, Spring 2003
- Human subjects approval
- Collect data, Summer 2003
- Consult with case-study participants
- Write report, Spring 2004