Commentary: Recent Approaches to Digitizing Hawaiian Archaeological Collections at Bishop Museum

Charmaine Wong
Bishop Museum, Honolulu

Mara Mulrooney
Bishop Museum, Honolulu

Summer Moore
College of William and Mary, Williamsburg

Abstract

The growing demand for digitizing collections, including archaeological assemblages, has driven many institutions to initiate programs that utilize current technologies to facilitate both curation efforts and access. Bishop Museum's Anthropology Department began digitizing its Hawaiian collections in 2008 through the Hawaiian Archaeological Survey (HAS) project. This project is conducted in collaboration with the Office of Hawaiian Affairs (OHA) and other organizations. Through the continued efforts of interns, volunteers, researchers, and staff members, more than 80,000 items have been inventoried, re-housed, and digitized as part of this effort. This paper outlines recent approaches by the Anthropology Department at Bishop Museum to digitize large and unique collections of related artifacts, field documents and maps, photographs and negatives, and project reports and department publications.

Introduction

In an age of technological advances, digital technologies have impacted the field of archaeology, particularly in terms of inventorying, cataloging, and digitizing archaeological collections. During the last decade, there has been a growing demand for institutions to digitize their collections, with major private, governmental, and international institutions leading the charge (Library of Congress 2002, 2011; Smithsonian Institution 2007, 2010, 2011a, 2011b; UNESCO 2003).

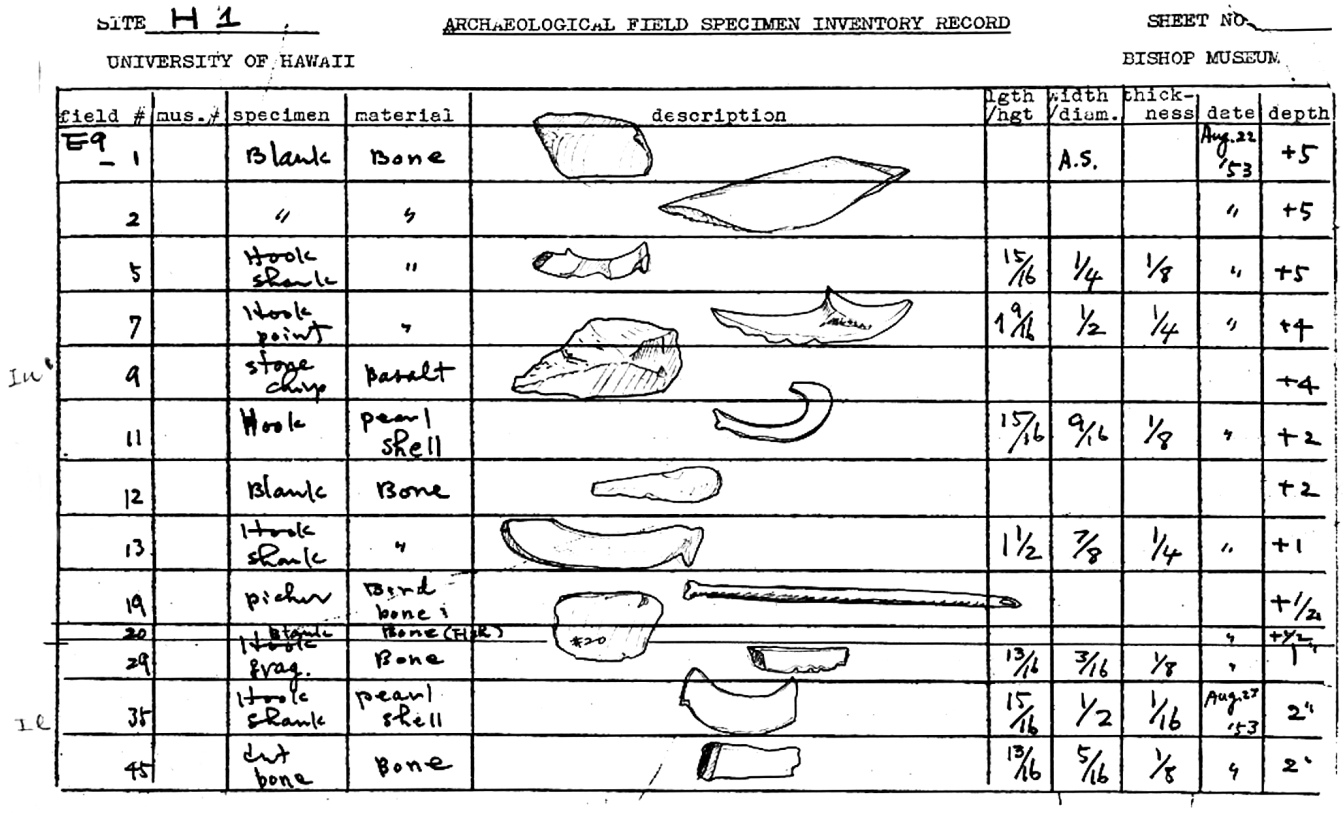
Much of the information related to digitizing involves archival material such as manuscripts, photographs, and maps (e.g., Federal Agencies Digitization Guidelines Initiative, Library of Congress 2011). Artifact digitization guidelines typically involve the use of photography or 3D scanning with the goal of disseminating information to a wide audience (e.g., Smithsonian Institution 2011a). Methods for digitizing museum assemblages, specifically those used for collections-based archaeological research, have not been fully explored and there are no overarching standards for current best practices in relation to archaeological digitization. Due to the various unique artifacts within a collection, the recent digital revolution amongst institutions with extensive archaeological collections, including Bishop Museum, requires each institution to develop policies that are specific to the materials in question. The digitization of Bishop Museum's Archaeology Collections is vital to properly integrating an inventory of these collections with those from other departments across the museum, assisting with care and curation efforts, and broadening access to the materials. This is crucial in encouraging collaboration between the Museum and researchers from various institutions worldwide. While the intended audience for online databases that result from these digitization efforts are archaeologists

and researchers, the Museum's various stakeholders, including cultural practitioners and the general public, will be able to access the databases as well.

Background

In 1950, Kenneth P. Emory systematically excavated the Kuli'ou'ou and Makani'olu Rockshelters on O'ahu (see Emory and Sinoto 1961; Kahn et al. 2014). When he brought materials from the excavations back to the Museum, he recognized the need to distinguish objects recovered from archaeological contexts from those that form the museum's Ethnology Collections (which were primarily acquired through donation, purchase, or collected on research expeditions during the late 19th and early 20th century). Today, the Archaeology Collections include materials relating to more than 500 archaeological projects undertaken by Bishop Museum archaeologists since 1950.

While undertaking archaeological research projects throughout the Hawaiian Islands and the wider Pacific region, Bishop Museum archaeologists, including Emory and Yosihiko H. Sinoto, compiled copious field notes, took numerous photographs, and drafted detailed, scaled maps as part of their field research projects. In some cases, the researchers created illustrated field catalogs to record the stratigraphic provenience of artifacts (Figure 1) and also recorded each field catalog number on the corresponding artifact while out in the field (Figure 2). These field catalogs were used to create itemized artifact inventories that were later discussed in reports and publications (e.g., Soehren and Kikuchi n.d.; Emory and Sinoto 1961). Given the important contextual information contained therein, the documents that form a portion of the Archaeology Collections are equally as valuable to ongoing archaeological research as the curated artifacts themselves.



SITE H 1 ARCHAEOLOGICAL FIELD SPECIMEN INVENTORY RECORD SHEET NO.

UNIVERSITY OF HAWAII BISHOP MUSEUM

field #	mus. #	specimen	material	description	lgth /hgt	width /diam.	thick-ness	date	depth
E9 – 1		Blank	Bone			A.S.		Aug. 22 '53	+5
2		〃	〃					〃	+5
5		Hook shank	〃		15/16	1/4	1/8	〃	+5
7		Hook point	〃		1 9/16	1/2	1/4	〃	+4
9		stone chip	Basalt						+4
11		Hook	pearl shell		15/16	9/16	1/8	〃	+2
12		Blank	Bone						+2
13		Hook shank	〃		1 1/2	7/8	1/4	〃	+1
19		pick	Bird bone						+1/2
20		Blank	Bone (HUM)	#20				〃	+1/2
29		Hook frag.	Bone		13/16	3/16	1/8	〃	1
35		Hook shank	pearl shell		15/16	1/2	1/16	Aug. 27 '53	2'
45		cut bone	Bone		13/16	5/16	1/8	〃	2'

Figure 1. A field catalog page from the H1 (South Point) excavations (copyright Bishop Museum).

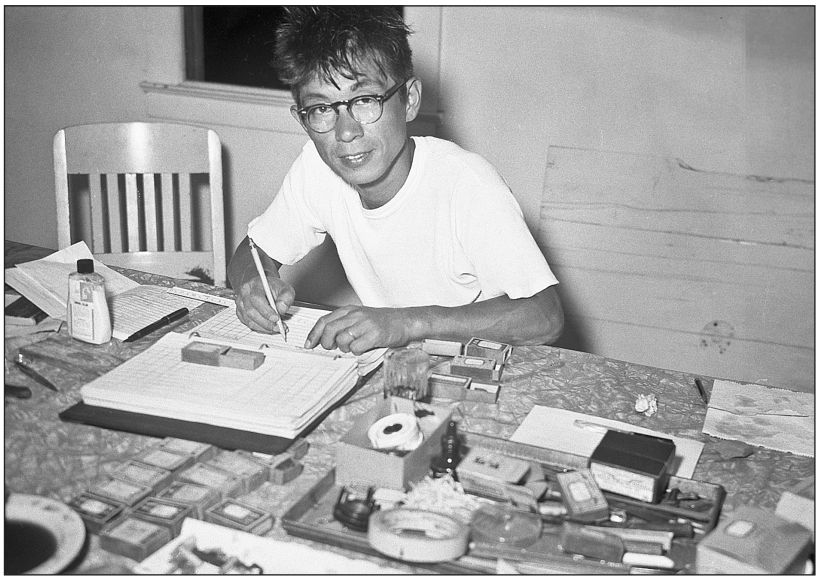


Figure 2. Yosihiko H. Sinoto cataloging artifacts from the H1 excavations, South Point, August, 1954 (photo by Kenneth P. Emory, copyright Bishop Museum).

Digitizing Collections

Increasingly, the digitization of collections is recognized as a crucial means to preserve data and facilitate accessibility for researchers in museums (Fresa 2013). Recently, large-scale efforts to digitize museum collections have included both objects and archival documents (Fresa 2013; Kalfatovic et al. 2009; Lynch 2002; Singh and Blake 2012). Bishop Museum's Anthropology Department began its own digitization initiative in 2008, in an effort led by Archaeology Collections Manager Rowan Gard and supervised by Bishop Museum archaeologists Tianlong Jiao and Jennifer G. Kahn. Evolving out of the Anthropology Department's collaboration with the Native Hawaiian Culture and Arts Program (NHCAP) and the Office of Hawaiian Affairs (OHA) on the Hawaiian Archaeological Survey (HAS), this project laid the groundwork for efforts to digitize a whole range of items in the Archaeology Collections. These efforts continue with the assistance of undergraduate interns and department staff members.

Artifacts

Based on a review of original field catalogs, reports, bag lists, and other inventories, it is estimated that the Archaeology Collections housed at Bishop Museum contain more than a million objects including artifacts, midden, soil samples, faunal material, and botanical material. However, many of the corresponding inventories of these collections have not been digitized, and digital records of these objects, such as photographs or drawings, are often restricted to those that appeared in field notes and published reports that have been added to the digital archive in recent years (see below).

The Museum's HAS digitization initiative began with the creation of itemized artifact inventories for the collections from Nu‘alolo Kai, Kaua‘i Island (Sites K2, K3, K4, K5; Bishop Museum Site No. 50-Ka-C10-002), and the South Point Dune Site, Hawai‘i Island (Site H1; Bishop Museum Site No. 50-Ha-B20-001), which resulted in a digital inventory of over 28,000 artifacts. As part of this effort, each artifact was assigned a unique identifier and photographed at high-resolution.

In 2013, researchers in the department established the Ho‘omaka Hou Research Initiative, which is a collaborative collections-based research program that is aimed at re-examining some of the Museum's collections using modern techniques (see Mulrooney et al. 2014). Recently, researchers associated with this initiative have inventoried more than 8,000 artifacts and 4,400 faunal elements from the Wai‘ahukini Rockshelter, Hawai‘i Island (Site H8; Bishop Museum Site No. 50-Ha-B21-006). More than 1,400 fishhooks from this site have been scanned at high resolution (Figure 3).

Figure 3. Examples of high-resolution 2-D inventory scans of a fishhook from Wai'ahukini Rockshelter (H8). Both sides of each fishhook are scanned at 2400 DPI and 600 DPI (with accompanying master inventory tag and scale bar).

The digital outputs resulting from these efforts include itemized inventories of objects in the collections and high-resolution recording of individual artifacts in some instances. These digital inventories bring together provenience information gathered from original field notes, information from previous analyses, and general information about object type and material type for each item. They therefore provide a digital record of collections from individual sites and/or projects that capture all of the currently available information about each artifact. These records will ultimately be linked to other digitized documents such as manuscripts and maps that correspond to the site and/or project.

Field Documents and Maps

Under the Museum's digitization initiative, Anthropology Department staff members have been working with student interns from the University of Hawai'i-Hilo, University of Hawai'i-Mānoa, University of Hawai'i-West O'ahu, and Northeastern University. Over the past six years, we have scanned field catalogs, field notes, and maps from past Museum archaeological projects at archival-quality resolution. These records include material from both academic research and commercial projects conducted by the department's cultural resource management division. This is just a small percentage of the Museum's total holdings. Bishop Museum currently curates more than 200 boxes of archaeological field documents, as well as a large collection of oversized maps that correspond to archaeological projects. Over the years, many of the field notes originally held in the Anthropology Department have been transferred to the Museum's Archives and we continue to work towards transferring the remainder of the documents to the Archives following digitization. Since the documents are split between two departments, we are working with staff members in the Archives to include the archaeological field notes that are curated there, a decision that will greatly facilitate their accessibility to scholars working with these documents in the future.

Photographs and Negatives

Another important aspect of recent digitization work has included locating, organizing, and scanning the enormous collection of archaeological field photographs, photographic negatives, and photographic logs from projects conducted by Museum archaeologists. As with the field documents, many of the photographs have been transferred to the Archives for curation. Since the inception of the Anthropology Department's digitization initiative, more than 35,000 photographs and negatives taken between the 1950s and the 1990s have been identified and scanned, and the associated logs have been

located and entered into a comprehensive database. These recent efforts have increased the accessibility of numerous photographs from well-known Bishop Museum archaeology projects, including Kuliʻouʻou Rockshelter (Oʻahu), Nuʻalolo Kai (Kauaʻi), South Point, Waiʻahukini Rockshelter, and Kalāhuipuaʻa (Hawaiʻi Island), and many others.

Project Reports and Department Publications

Another significant aspect of the Anthropology Department's document digitization work, also supported by OHA, includes the inventorying and digitization of project reports and departmental publications produced by Bishop Museum archaeologists. As part of this initiative, over 650 reports have been scanned at high resolution that correspond to the Museum's Hawaiʻi-based projects.

Digitization and the Long-Term Care of Collections

An added benefit of the digitization of artifacts, maps, reports, and other documents has been the implementation of improved curation practices. As artifacts are inventoried, they are transferred from original storage containers such as cigarette boxes, paper bags, and assorted tins (Figure 4) into archival-safe containers such as plastic bags and acrylic boxes (Figure 5). Documents, photographs, and negatives are transferred to acid-free folders and boxes following digitization. Maps are laid flat when possible and placed in wide format drawers to ensure that these important records are preserved. Thus, the digitization project has yielded a number of highly tangible long-term benefits. Not only does digitization allow for all items from a particular research or cultural management project to be stored together on digital media, a critical factor in enhancing the research value of the collections, it also allows for the permanent preservation of collections of objects, including artifacts, field documents, and reports, in digital format. As with any digital record, the department will continuously update the databases to keep up with newer programs and evolving digital formats so that the information is not lost.

The dissemination of information contained in these digital files is also one of the major long-term goals of the Museum, and collaborative efforts continue relating to this goal. The HAS database is currently available through the Museum's webpage (http://data.bishopmuseum.org/HAS2/index.php?b=i) and the inventories of many digital collections will be incorporated into OHA's Papakilo Database in 2015 (http://www.papakilodatabase.com/main/main.php). The online Hoʻomaka Hou Research Initiative Fishhook Database, which will include itemized

Figure 4. An example of typical storage employed by Bishop Museum archaeologists during the 1950s.

Figure 5. Lithics from H8 (Wai'ahukini Rockshelter, Hawai'i Island) after re-housing and inventorying.

inventories and high-resolution scans of more than 3,400 fishhooks from the H1 (South Point) and H8 (Wai'ahukini Rockshelter) sites, will be launched on the Museum's webpage in 2015. These and other online forums will be crucial in allowing descendent communities, researchers, and the general public to access significant archaeological collections.

Conclusion

Since the Anthropology Department's digitization initiative began, over 80,000 items, including artifacts, documents, photographs, and reports, have been scanned, photographed, or otherwise digitized. The digitization process has provided a valuable opportunity to view, organize, and re-house the Anthropology Department's collections, creating unique educational opportunities for the department's student interns. As digitization efforts continue and new technology develops, we will continue to improve upon best practices for the digital archiving of the Hawaiian and Pacific Archaeology Collections housed at Bishop Museum. We hope that these initial efforts will provide Hawaiian archaeologists with added insights into the challenges of bringing legacy collections into the rapidly changing digital age, and also prompt archaeologists working in academia and commercial archaeology to start thinking about the curation and digitization of their own collections and archives.

Acknowledgements

We thank the Office of Hawaiian Affairs, the Native Hawaiian Culture and Arts Program, the Hawai'i Council for the Humanities, and Bishop Museum for their continued financial support of digitization efforts in the Anthropology Department at Bishop Museum. We also thank former staff members who contributed to these digitization efforts, including Gina Farley, Rowan Gard, Teresa Ingalls, Jennifer Kahn, Lauren May, Ashley Robinson, and Victoria Wichman. We also thank the many interns and volunteers who greatly contributed to this project: Brie Adams, Brandon Agcaoili, Kelsie Aguilera, Valerie Atkinson, Nader Ayadi, Kalpana Balaraman, Prashanth Balaraman, Scott Belluomini, Mai Bui, Vanessa Cabrera, Heather Calderwood, Leischene Calingangan, Aaron Chang, Haley Close, Avalon Coley, Melissa Cox, Robert DiNapoli, Shayna Diamond, Mary Elliott, Clarence Fraser, Rachel George, Jay Hopfensperger, Grace Jacobson, Kristin Jones, Jacie Kaneshiro, Robin Kelii, Jordan Koffman, Marty Kooistra, Robin

Kuykendahll, Louise-Solange Lacasse, Hui-Lin Lee, Katie Leonardi, Kaile Luga, Raquel Macario, Cynthia McCoy, Alex McDougle, Hepva Medina, Caitlin Neal, Linnea Neuber, Seal Newsome, Jacki Pacheco, Jennifer Poloa, Isvan Quang, Kauʻilani Rivera, Ben Robbins, Rebecca Roelands-Keim, Summer Roper, Mary Schmidt, Tara Seaver, Zoe Soileau, Channing Stephens, Stacy Summerall, Sabrina Tee, Heather Terstegge, Bee Thao, Rosanna Thurman, Susannah Wong, Robert Young, and Tim Zapor.

References

Emory, K.P. and Y.H. Sinoto, 1961. *Oahu Excavations*. Bernice P. Bishop Museum Special Publication 49. Honolulu: Bishop Museum Press.

Federal Agencies Digitization Guidelines Initiative. Available at: http://www.digitizationguidelines.gov/guidelines/

Fresa, A., 2013. A Data Infrastructure for Digital Cultural Heritage: Characteristics, Requirements, and Priority Services. *International Journal of Humanities and Arts Computing* 7[Supplement]:29–46.

Kahn, J.G., T.M. Rieth, P.V. Kirch, J.S. Athens, and G. Murakami, 2014. Re-Dating of the Kuliʻouʻou Rockshelter, Oʻahu, Hawaiʻi: Location of the First Radiocarbon Date from the Pacific Islands. *Journal of the Polynesian Society* 123(1):67–90.

Kalfatovic, M.R., E. Kapsalis, K.P. Spiess, A. Van Camp, and M. Edson, 2009. Smithsonian Team Flickr: A Library, Archives, and Museums Collaboration in Web 2.0 Space. *Archival Science* 8(4):267–277.

Library of Congress, 2002. *Preserving our digital heritage: plan for the national digital infrastructure and preservation program appendices*. 1–257. Available at: http://www.digitalpreservation.gov/documents/ndiipp_plan.pdf

——2011. *Preserving our digital heritage: the national digital information infrastructure and preservation program 2010 report*. 1–141. Available at: http://www.digitalpreservation.gov/documents/NDIIPP2010Report_Post.pdf

Lynch, C., 2002. Digital Collections, Digital Libraries & the Digitization of Cultural Heritage Information. *Microform & Digitization Review* 31(4):131–145.

Mulrooney, M., K. Esh, and M.D. McCoy, 2014. The Hoʻomaka Hou Research Initiative at Bishop Museum: Progress and Prospects. *Society for Hawaiian Archaeology Newsletter* 6(1):3–4.

Singh, S. and M. Blake, 2012. The Digitization of Pacific Cultural Collections: Consulting with Pacific Diasporic Communities and Museum Experts. *Curator: The Museum Journal* 55(1):95–105.

Smithsonian Institution, 2007. *Digitization Steering Committee Report*, *March 2007*. Smithsonian Institute, 1–32.

——2010. *Digital strategic plan: creating a digital Smithsonian*. 1–17. Available at: http://www.si.edu/Content/Pdf/About/2010_SI_Digitization_Plan.pdf

——2011a. Digitization and Digital Asset Management Policy. 1–9. Available at: http://www.si.edu/content/pdf/about/sd/SD610.pdf

——2011b. The Smithsonian Institution's Human Origins Program. Available at: http://humanorigins.si.edu/evidence/3d-collection

Soehren, L.J. and W.K. Kikuchi, n.d. Archaeological Survey and Excavations: Sites K2, K3, K4, K5, Nualolo-Kai, Napali, Kauai. Unpublished report on file, Anthropology Department, Bishop Museum.

UNESCO, 2003. Charter on the Preservation of Digital Heritage. Available at: http://portal.unesco.org/en/ev.php-URL_ID=17721&URL_DO=DO_TOPIC&URL_SECTION=201.html