Third Annual Workshop in Archaeology
New Technologies in Archaeology and How these have helped Expand our Knowledge of the Past
Saturday, October 13, 2018
Meadowcroft Rockshelter and Historic Village, Avella

Sponsored by the Meadowcroft Rockshelter and Historic Village, the Society for Pennsylvania Archaeology and the Heinz History Center

2018 Workshop Description

In recent years, Archaeology has acquired several new tools for helping identify, map, measure and assess archaeological sites and associated material remains. This year's workshop will feature several of these new approaches. Presentations will discuss the new technologies being used in archaeological research and provide examples of their application.

WORKSHOP PROGRAM PARTICIPANTS INCLUDES:

Morning Session:

11;00 am – 11:10 AM Welcome and Workshop Overview by David Scofield, John Nass and Thomas Glover.

Workshop Chair: Tom Glover

11:10 AM – 11:45 AM Dr. Jeff Sumey (California University of Pennsylvania) *An Overview: Drones Technology and Their Commercial and Professional Applications*

11:45 AM – 12:20 PM Dr. Cassandra Kuba (California University of Pennsylvania) *New to the Area? Bioarchaeological Exploration of Ancient Population Movement in Southwestern Pennsylvania*

12:20 PM – 12:55 PM Dr. Bernard Means (Virginia Commonwealth University) *An Overview: Creation and Use of 3-D Scanning models for Archaeological Research and Museum Display*

12:55 PM – 1:40 PM Lunch

Afternoon Session:

1:40 PM – 2:15 PM	Jamie Davis (Ohio Valley Consultants, Inc) *Use of Drones in Mapping Archaeological Sites*
2:15 PM – 2:50 PM	Dr. Jarrod Burks (Ohio Valley Consultants, Inc.) *Geophysical Methods and Magnetometry for Site Identification and Assessment*
2:50 PM – 3:25 PM	Stefan Woehlke (University of Maryland) *LiDAR as an Investigative Tool in Archaeological Research*
3:25 PM – 4:00 PM	Dr. Timothy Abel (Jefferson Community College) *Spectroscopy: Insights on Trade and Social Interaction*
4:00 PM – 4:30 PM	Dr. Kurt Carr (Pennsylvania State Museum) Workshop Discussant

Guided Tour of Rockshelter for Workshop Participants and Guests after 4:30 PM

Additional Activities

Drone Demonstration in Open area adjacent to office and meeting room

Flint Knapping Demonstration. This demonstration will feature an expert flintknapper who will demonstrate Native American stone tool manufacture by before contact in Pennsylvania.

Demonstration of prehistoric food processing using experimental technology

Site Recording in Cultural Resources Geographic Information System. Pennsylvania State Historic Preservation Office. Recording of archaeological sites is an essential task in protecting and preserving our archaeological resources. Assistance in recording your archaeological sites will be provided by these qualified individuals. Stop and talk to the staff from the Historic Preservation Office.

Artifact Identification – SPA chapter members. These individuals have over 70 years of combined experience with archaeological artifacts. Bring in your historic or prehistoric artifacts for identification by the experts.

THE PARTICIPANTS

Title: "UAS/Drone Technology & Societal Impacts"

Dr. Jeffrey Sumey
Department of Applied Engineering and Technology
California University of Pennsylvania
California, PA 15419

Unmanned Aerial Systems, aka drones, are currently poised to make major impacts on nearly every aspect of modern society. In this talk, Professor Jeff Sumey, creator and director of the UAS/Drone Technology program at California University of PA, presents a glimpse of current drone technology and potential applications of low-altitude aerial imaging.

Title: New to the Area? Bioarchaeological Exploration of Ancient Population Movement in Southwestern Pennsylvania

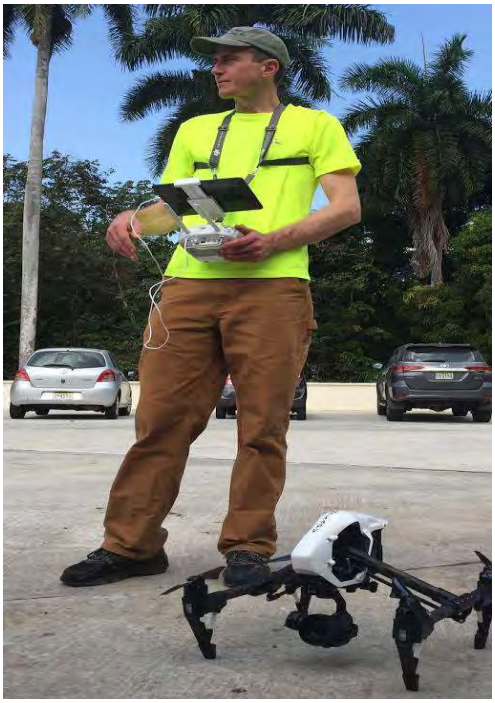
Dr. Cassandra Kuba
Professor of Anthopology
Anthropology Program
Department of History, Politics, Society and Law

This talk will address biological methods of determining if individuals recovered from Mongongahela Native American archaeological sites in southwestern Pennsylvania were born and lived locally or had migrated to/from the region during their lifetime. Discussion will be made of how chemical, genetic, metric, nonmetric and paleopathological analyses can be used to study population movement, in general, and how it can be and has been applied to the Mon culture. The role of local archaeological groups in aiding these endeavors will also be addressed.

Title: An Overview: Creation and Use of 3-D Scanning models for Archaeological Research and Museum Display

Dr. Bernard Means
Associate Professor of Anthropology
3-D Curation Lab
Virginia Commonwealth University
Richmond, Virginia 23284

3-D scanning is one way to protect collections against loss, theft, or damage. Digital models can be stored or shared off site, and, while not a substitute for a real object, although it is an imperfect solution. However, one 3-D documents a collection (photogrammetry, laser scanning, structured light scanning, etc.) the process is time consuming, requires some level of expertise, and equipment that can't be justified in some museums, where literally keeping the lights on is an issue. This is one reason why the Virtual Curation Laboratory works with so many different museums, especially smaller ones, to provide that expertise and technical equipment. However, our efforts are only a small way to a solution to protecting the past for the future. Perhaps others can contribute, when they can, to these efforts as well.



Title: Providing a New Perspective: Drone Based Photogrammetry in Archaeology and Historic Preservation

Jamie Davis
GIS & UAS Photogrammetry
Ohio Valley Archaeology, Inc.
4889 Sinclair Rd Ste 210
Columbus, OH 43229

Photogrammetry has quickly developing into an essential tool for archaeology and historic preservation, and combing photogrammetry with small Unmanned Aerial Systems (UAS) or drones, can provide a perspective that was previously unattainable. Drone based photogrammetry has proven its effectiveness in many areas of archaeology and historic preservation. Historic buildings can be modeled to within centimeter accuracy; archaeological features can be documented as lever before; and the subtle terrain of large areas can find unknown or forgotten features of prehistoric earthworks.

Title: Detecting the Ancient Past with Hi-Tech Geophysical Survey Instruments: Re-Discovering Ancient Earthworks in the Ohio Valley

Dr. Jarrod Burks
Director of Archaeological Geophysics
Ohio Valley Archaeology, Inc.
4889 Sinclair Rd Ste 210
Columbus, OH 43229

Ancient geometric earthwork enclosures were once common in the Ohio Valley, especially along the major tributaries from about Marietta, OH downstream to Louisville, KY. Today, most of these sites have been destroyed by plowing and other types of development. Or have they? In this talk we will hear about efforts to relocate Ohio's ancient earthwork sites using remote sensing—a combination of aerial photographs and geophysical survey instruments. Many sites once thought to be "lost" have been rediscovered and numerous previously unknown sites have been found, as well.

Title: ***LiDAR as an Investigative Tool in Archaeological Research***

Stefan Woehlke
Department of Anthropology
University of Maryland

LiDAR has grown to prominence in archaeological circles over the last decade. Today, it is more widely available than ever before, with some states providing free access to statewide data. As archaeologists, we know that this data is valuable, but we aren't exactly sure of all the ways that it can be applied at different scales. This presentation will provide a brief introduction to LiDAR technology, and then will discuss its application in four general areas: resource identification, analysis, 3-D documentation, and interpretation.

Title: Spectroscopy: Insights on Trade and Social Interaction

Dr. Timothy J. Abel
Consulting Archaeologist and Professor, SUNY at Canton and Jefferson and Jefferson Community College
1220 Coffeen Street
Watertown, New York 13601

Spectroscopy is the science of determining what things are made of. In archaeology, knowing what elements are present in an artifact allows us to trace that item back to it's point of origin: where in the world that object came from. Knowing where an artifact is from, and where it was found, tells us something about the trade and social interactions of the people who used it. This presentation will focus on two recent projects involving spectroscopy. One, using X-ray Fluorescence, a colleague and I analyzed an assemblage of metallic artifacts from proto-contact NW Ohio, determining which of the artifacts were of European or native copper manufacture and mapping a chronology of how European goods were acculturated into that society. Second, using Laser-ablated Inductively-coupled mass spectrometry and X-ray Fluorescence, colleagues and I traced the origins of steatite beads found in Iroquoian sites on the north shore of Lake Ontario and St. Lawrence Valley.

Discussant: Dr. Kurt Carr, Senior Curator of Archaeology, State Museum of Pennsylvania
Harrisburg, PA

Biographical Information about the Presenters:

Dr. Timothy Abel
Tim Abel is adjunct professor of Anthropology at Jefferson Community College in Watertown, New York and an independent CRM consultant. He obtained his Ph.D. from the University of Albany. His research interests focus on Great Lakes Archaeology, in particular the Late Archaic and Woodland periods, ceramics, trade and exchange, mortuary patterns, St. Lawrence Iroquoians and the War of 1812.

Dr. Jarod Burks
Dr. Burks has been an archaeological Principal investigator with OVAI since 1999. He is an expert in the use of geophysical instruments in archaeology, such as magnetometers and ground-penetrating radar, and he has conducted geophysical surveys all across the country and beyond—including on missions to search for missing U.S. servicemen. Recently, Dr. Burks directed the 2015 Lt. Ewart Sconiers Recovery Project, Lubin, Poland. Jarrod also shares his geophysics expertise with other archaeologists as an instructor in the National Park Service's (Midwest Archeological Center) annual workshop on geophysics in archaeology, which moves to a new place in the U.S. each year.

In addition to being a very active and respected field archaeologist, Dr. Burks also serves in many other professional capacities. He is the president of the Heartland Earthworks Conservancy, an organization that works to preserve Ohio's ancient American Indian mound and earthwork sites; he is the treasurer of the Midwest Archaeological Conference; and he is the past president and currently a trustee of the Ohio Archaeological Council. But more than anything, Jarrod thoroughly enjoys sharing his discoveries about Ohio's past with the public. He gives dozens of talks annually to a wide variety of public audiences all around Ohio and in surrounding states.

Dr. Kurt Carr
Dr. Kurt Carr has been with the Pennsylvania Historical and Museum Commission since 1980 where he started as a review archaeologist with the Bureau for Historic Preservation and served as the Chief of the Division of Archaeology and Protection between 1988 and 2005. He has been the Senior Curator of Archaeology at The State Museum of Pennsylvania since November 2007. In this position, along with a staff of eight archaeologists, he supervises the curation of the archaeological collections of the State Museum of Pennsylvania, (numbering over eight million artifacts), develops exhibits for the Hall of Anthropology and Archaeology at the State Museum, develops a variety of public outreach programs and conducts field research on significant issues of Pennsylvania archaeology. His research interests include Early Holocene Native American cultural adaptations, the role of population density in cultural change, lithic technology and quarries, settlement pattern analysis, geomorphology and environmental reconstructions. He received his Ph.D. in Anthropology from the Catholic University of America in 1992.

Working in Pennsylvania, I have been able to examine how cultures have changed and, more importantly, why cultures have changed over the thousands of years of Native American cultural evolution. I believe this information can be applied to understanding and predicting change in our own culture.

Jamie Davis

Jamie Davis is employed at Ohio Valley Archaeology, Inc., since 2010 and has worked as a professional archaeologist since 2009. He earned his B.A. degree in anthropology and B.A. degree in mathematics from Ohio University. Jamie also earned a Geographic Information Systems (GIS) Masters Certificate from Penn State University in 2011. In his current position at OVAI, Jamie serves as an archaeological field supervisor and crew chief, and he is the director of the GIS program. With his GIS expertise, Jamie is responsible for making project maps, performing viewshed analyses, and conducting various types of cultural resources-related terrain analysis. He has developed a particular interest in the spatial arrangement of archaeological sites as pertaining to various terrain and environmental variables. Jamie's expertise is instrumental in pre-project planning, especially where archaeological resource modelling can focus field effort and ultimately reduce costs and increase survey efficiency. Jamie has emerged as one of the industry leaders in implementing Unmanned Aerial Systems (UASs) or drones and photogrammetry into Cultural Resource Management and Historic Preservation projects. His experience with using LiDAR and Digital Elevation Models (DEMs) in GIS and understanding of archaeological landscapes give him the unique ability to incorporate drones into archaeology. Jamie has also used drones and photogrammetry to create 3-Dimensional Models of historic architecture.

Dr. Cassandra Kuba

Dr. Cassandra Kuba first took an interest in archaeology by puttering about the farm of her great uncle in the "Browntown" area of Plum Boro, PA, discovering both historic and prehistoric artifacts and food remains, inspiring her to wonder about the people who came before. Pulling on her interests in the realm of forensics, Dr. Kuba sought training in human skeletal analysis at Mercyhurst College (now, University), which included prehistoric investigations into the Eriez Native Americans, too. Continuing her forensic work and expanding into historic populations, she earned her Master of Science in Human Biology at the University of Indianapolis, which included opportunities to conduct DNA analysis on archaeological remains. Her doctoral dissertation research at Arizona State University focused on biological relatedness amongst a postmedieval British sample. Dr. Kuba has conducted research on skeletal remains from sites in ancient Nubia; historic London; prehistoric Native American sites in Arizona, Pennsylvania, Ohio, and Indiana; lost historic cemeteries in Indianapolis; and numerous forensic situations. Her expertise has been utilized in research for television shows and mystery novels, as well.

Dr. Bernard Means

Dr. Bernard K. Means is an Assistant Professor of Anthropology at Virginia Commonwealth University in Richmond. His scholarly pursuits include reconstructing American Indian village spatial and social organizations, the research potential of archaeological collections, and the history of archaeology across the Americas, especially during the Great Depression. Dr. Means is also director of the Virtual Curation Laboratory, which is creating three-dimensional (3-D)

digital models of archaeological and paleontological objects used for teaching, research, and public outreach from across the Americas as well as northern India. He has 3-D scanned mastodon bones and teeth from Ohio, Virginia, and even a mastodon tooth that belonged to Ben Franklin found in Philadelphia..

Dr. Jeffrey Sumey
Jeff Sumey has been a professor in the Computer and Electrical Engineering Technology programs at California University of Pa for over 30 years. During this time, he has continued to hone skills in piloting and applications of multiple forms of unmanned aerial systems including fixed wing, helicopters, and multirotors currently holding over 3,500 hours of flight operations. He is developer and program coordinator of CalU's new UAS/Drone Technology AS program launched last fall and the BS program proposed to launch fall 2019. Jeff has worked on grant projects with NASA, ONR, and the PA Space Grant Consortium. His current interests are in the applications of drone technologies to PA agriculture challenges. He holds a BS in Math and Computer Science and a MS in Computer and Information Science from WVU.

Stefan Woehlke
Stefan Woehlke is a PhD candidate at the University of Maryland. His work focuses on historical archaeology, human-environmental interactions, and digital cultural heritage. He is currently writing his dissertation on the impacts of emancipation on the African American community in western Orange County, Virginia around Montpelier, the home of Pres. James Madison.

GIS and LiDAR have played an important role in the development of Stefan's career. He first used LiDAR data in the form of high-resolution digital elevation models to analyze cultural landscapes. Since then, he has used terrestrial LiDAR to document archaeological excavations and historic structures. Some of this data has been used in the design and reconstruction of structures on the property of the Montpelier Foundation. He has also taught a course to introduce students to the field of digital cultural heritage in which students learn how to use LiDAR, photogrammetry, and 3-D modeling software to create a variety of digital products based upon archaeological resources and architectural drawings of historic structures.

EVENT SPONSORS

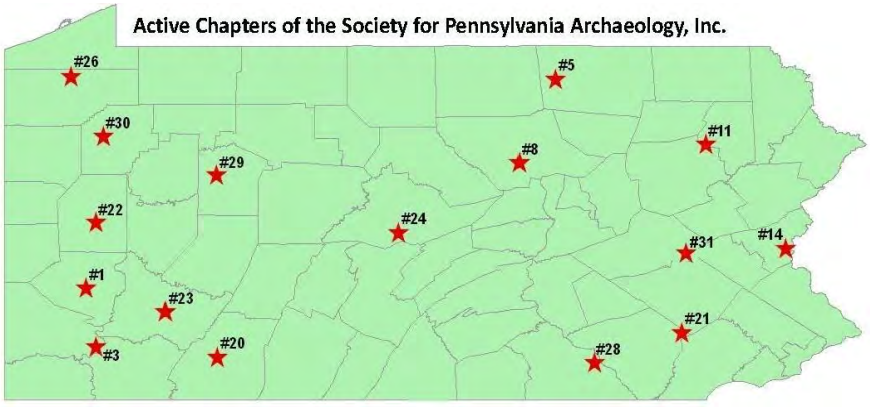
MEADOWCROFT ROCKSHELTER AND HISTORIC VILLAGE

CELEBRATING 50 SEASONS

Meadowcroft Rockshelter and Historic Village, the oldest site of human habitation in North America, is located in Avella, Washington County, Pa. Meadowcroft Rockshelter, a National Historic Landmark, features 16,000-year-old evidence of the region's earliest inhabitants under a massive rock overhang. In addition to the Rockshelter, the site is also home to three outdoor historic areas, including a 16th century Indian village, 18th century Frontier Trading Post, and 19th century village that help visitors experience life over the past 500 years.

The Society for Pennsylvania Archaeology, Inc. was organized in 1929 to:

- Promote the study of the prehistoric and historic archaeological resources of Pennsylvania and neighboring states.
- Encourage scientific research and discourage exploration which is unscientific or irresponsible in intent or practice.
- Promote the conservation of archaeological sites, artifacts, and information.
- Encourage the establishment and maintenance of sources of archaeological information such as museums, societies, and educational programs.
- Promote the dissemination of archaeological knowledge by means of publications and forums.
- Foster the exchange of information between the professional and the avocational archaeologists.



The History Center is an educational institution that engages and inspires large and diverse audiences through programs that enable links to the past, understanding in the present, and guidance for the future by preserving regional history and presenting the American experience with a Western Pennsylvania connection.

Devoted to the history and heritage of Western Pennsylvania, the History Center (legal name – the Historical Society of Western Pennsylvania) is Pennsylvania's largest history museum and a proud affiliate of the Smithsonian Institution.

The Senator John Heinz History Center family of museums and programs includes the Heinz History Center, Western Pennsylvania Sports Museum, Fort Pitt Museum, Meadowcroft Rockshelter and Historic Village, Detre Library & Archives, and the new Museum Conservation Center. The 370,000 square-foot museum presents compelling stories from American history with a Western Pennsylvania connection in an interactive environment perfect for visitors of all ages.

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