



**William R. Adams**  
**Zooarchaeology Laboratory**  
Indiana University, Bloomington  
Department of Anthropology  
Student Building 025, 401 E. Kirkwood Ave.  
Bloomington IN 47405-7113  
812-855-2638



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## **2019 ANNUAL REPORT**

Prepared by Dr. Laura Scheiber, Laboratory Director

With contributions by  
Jess Miller-Camp, Samantha Couch, Thomas Brimm,  
and the WRAZL Team

The following is the annual report on activities of the William R. Adams, Zooarchaeology Laboratory (WRAZL) housed at the Indiana University Anthropology Department in Bloomington, Indiana, and a brief update of major projects undertaken, volunteer and employee activities and hours, specimen loans, and community outreach projects in 2019. With help from our undergraduate volunteers, we improved the biological collections, originally funded by a grant from the National Science Foundation. We attracted new students and maintained a committed volunteer team. We are an active member of the Indiana University educational environment by providing unique student learning opportunities and specimen loans for classes and community outreach. We report a total of 4,313 combined volunteer and employee hours, 199 visitors, 217 specimens loaned for classroom use and research projects outside of the laboratory, and 21 courses with a total of 877 students using laboratory specimens in 2019. Additionally, hundreds of specimens were used in-house by graduate and undergraduate students that conduct their research on site. We worked with 46 active researchers and volunteers as well as maintain professional connections with 21 recent alumni. Our staff and affiliates published 45 publications and reports and authored 43 professional presentations. We administered, coordinated, and collaborated on 12 grants based on ongoing research, as well as submitted three grant proposals for further funding. We also report that we are in full compliance with the Indiana University Environmental Health and Safety Office and the Office of Research Compliance; we are following all Institutional Biosafety Committee recommendations and guidelines; and we hold current collections permits in scientific collection in zoology and archaeology.

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**WILLIAM R. ADAMS ZOOARCHAEOLOGY LABORATORY, FOUNDED 1945**  
**10,000 MODERN COMPARATIVE FAUNAL SPECIMENS**  
3,634 birds, 2,993 mammals, 1,936 fish, 1,390 reptiles, 229 amphibians

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## ***Section A: THE COLLECTION***

### ***History and Statement of Purpose***

The William R. Adams Zooarchaeology Laboratory (WRAZL) was established in 1945 by William “Dick” Adams and Glenn A. Black for the purpose of accumulating skeletal remains of indigenous animal species to identify faunal remains from excavations at the Angel Mounds State Historic Site (12VG1), a large prehistoric mound complex in southern Indiana. Initial funding for the lab came partially from Eli Lilly. Acting as the director of the lab for almost 60 years, Dick Adams steadily added to the collection during this time by contacting zoos, government agencies, trappers, pet stores, and museums around the country. He also amassed much of the collection himself through fishing, hunting, and trapping animals throughout the United States. Dr. Laura Scheiber was hired as the lab’s 2nd director when Dick retired in 2003. She formally changed the name from IU Zooarchaeology Laboratory to the William R. Adams Zooarchaeology Laboratory. The lab continues to add new specimens to further increase breadth and scientific research value of the collection. The lab is dedicated to furthering education and research in faunal based archaeological analysis, biological variation, digitizing initiatives, and biospatial geographic databasing.

The WRAZL collection is a scientifically invaluable record of biodiversity. It includes a variety of local and exotic animals distinctive in sheer breadth and number. It is one of the largest comparative skeletal collections in the country. It includes one of the largest collections of non-human primates anywhere (over 400); over 80 endangered and threatened species such as grizzly bears, bald eagles, sea turtles, extinct dire wolf, and mastodon. The lab has special permits to collect and curate these animal skeletons. Many of the specimens in the lab are no longer available for collection purposes because of extinction or endangerment.

### ***NSF Project Summary and Updates on Continuing Collections Management***

Funding for our NSF Biological Research Collections improvement grant (#0846697) ended in August, 2013, and we have successfully completed the associated re-housing of much of our comparative skeletal collection. As anticipated, activities and capital upgrades made possible by the grant such as the installation of our high-density shelving system (completed February, 2010) continue to greatly improve our curation capacity and quality. This installation was made possible through the American Recovery and Reinvestment Act of 2009 (ARRA), which funded our grant from the National Science Foundation (NSF). The laboratory manager and hourly employee positions funded by this grant were critical to the long-term management of the laboratory and comparative collection.

We reached our goal of re-housing all specimens that were located on the high-density shelving, which has improved the organization of the comparative collection beyond that which was required for our NSF grant. We finished re-boxing and initial inventorying of all these specimens as well. The improved organization of specimens has made using the collection easier and more efficient for undergraduate volunteers, graduate students, faculty, and researchers. Further, individually bagged elements and an element inventory sheet for each specimen greatly reduces the amount of time researchers spend looking for specific bones, an improvement that will remain beneficial to future generations of researchers using the laboratory and the collection. In 2013, we purchased the necessary supplies for our re-boxing project, including one thousand

shoebox-sized acid free boxes and 12,000 vinyl sleeves to hold newly designed specimen labels that contain additional information about specimen completeness and condition. Since 2014, our volunteers have moved inventoried specimens from old boxes into the new storage containers; and volunteers and laboratory staff systematically affixed the vinyl sleeves to boxes containing inventoried specimens.

In 2018, we purchased a high-speed document scanner to digitize our paper records. Undergraduate volunteers completed digitizing the accession records in 2019 in order to compare the scanned accession records to the information currently entered in the database. In 2018 we also tested our mammal label template, adjusting the design for ease of reading and use and to accommodate multiple specimens. We added location information to the labels to help maintain organization when researchers and instructors move boxes from the shelves for analysis and teaching. We collated the necessary data to create labels for our avian specimens and have begun gathering data for our reptiles. We also developed better written standards for assessments of categories of age and condition, and we double-checked all specimens with missing information on the inventory sheets. In 2019 we coordinated a group of volunteers to assist in fish rehousing, consolidation of avian specimens by species, and digitization of element bone inventories. Additionally, we began compiling inventories of our reptile, amphibian, and mollusk specimens and began digitizing these records in 2019. Inventories of reptile elements will be completed in early 2020.

During 2018-2019, volunteers additionally consolidated smaller avian specimens. This project improves the ease of locating specimens by moving individually-boxed specimens into larger boxes grouped by species. We designed a specialized label format for boxes with multiple specimens. The consolidation improves overcrowding on the shelves, allowing easier access as well as space for new accessions. In the fall, 2019, we also worked with Anthropology Department graduate student Collections Manager, Lindsey Mattern, who modified several of our forms into editable pdf versions. We also developed a policy and form for researchers who propose to use photographs of specimens in our collection to assure that they provide proper attribution in their research presentations and publications.

### ***Fish Re-housing and Consolidation***

The William R. Adams Zooarchaeology fish collection consists of nearly 2,000 specimens. We completed the unification of all synonymous common names and binomials for each fish species under a single name in 2018. This multi-year venture was particularly complicated because some common names are associated with numerous species. For verification, FishBase provided the most accurate information, incorporating information from Integrated Taxonomic Information Service (ITIS), Catalogue of Life (COL), and World Register of Marine Species (WORMS). Nomenclature from this website source is corroborated by the American Fisheries Society. Reorganization and consolidation of the fish collection continued in 2019. Samantha Couch continued to lead this initiative. Several undergraduate assistants worked closely with Sam on this project. They rehoused fish specimens and consolidated specimens of the same species to reduce the footprint of the fish collection. This increases ease of access and creates space for new acquisitions. Initial rehousing of all the fish was completed in 2019. Further consolidation was postponed until elemental inventories are completed. In preparation for elemental inventories, two undergraduates were trained on fish osteology in 2019. In

response to student turnover, Couch created a fish osteology reference guide to simplify future training.

### ***Mollusk Collection Organization***

The invertebrate collection of the William R. Adams Zooarchaeology Laboratory is the least documented in the lab. Specimens range from fresh-water mollusks to beautiful, rare seashells and corals. Dozens of large marine shells and unusually preserved coral specimens were collected before modern bleaching and environmental degradation, adding critical data to issues of recent climate change. This is the only part of the collection with separate sub-units. Four older collections include the William and Mildred Adams Collection, the Ross Stotter Collection, the Yates Collection, and the Pitkin Collection. The Randy and Deborah Patrick Collection of freshwater mollusks is our fifth collection, which was donated in 2007. Our most recent collection came in 2019 from the Peoria Tribe Aquatic Facility. The biggest issue with the invertebrates is that many of them lack identifying numbers or documentation. At the end of 2018, we began organizing the mollusks. We reviewed the paper records to compile a written history of the five collections and completed an inventory of the specimen drawers so that we could reorganize specimens according to sub-collection. We began compiling an inventory of the Patrick collection, which has its own catalogue. These records will be digitized in 2020.

Some of the shells in the Yates Collection have been identified, but the catalogue is missing or was never completed. The Pitkin Collection catalog has been identified, but we cannot find specimens matching the Pitkin numbering system. They may be in off-site storage. The William and Mildred Adams Collection catalog has not been located, but many documents refer to the collection. Hundreds of color photos arranged in several photograph albums depict and identify specimens that we believe to be part of this collection. We plan to photograph our unnumbered specimens and compare them to the photos in the albums in the near future.

The Stotter Collection includes thousands of shells and other items currently housed at both WRAZL and the IU Paleontology Collection. In 1975, Ross and Jane Stotter donated their collection of over 10,000 shells to the University including hundreds of exotic seashells from the Great Barrier Reef in Australia, the Philippines, Florida and Hawaii. A partial catalogue helps us organize and identify the items in this collection, most of which are unnumbered. After years in long-term storage, part of the collection was recently moved to the Geological Sciences building. Our colleagues at the Paleontology Laboratory have been extremely helpful in identifying specimens at WRAZL likely from Stotter. We will continue to collaborate on issues related to joint-curation and management of the Stotter Collection. In 2019 we connected with Kelly Conway, a self-trained malacologist (the study of mollusks). She is interested in assisting us in identifying and inventorying the Stotter Collection in 2020.

### ***Digital Collections Records Management***

About a decade ago, we imported our entire database into the Specify software, specifically designed to manage species and specimen data for biological research collections. It is used in more than 500 natural history collections in dozens of countries. We have since printed inventory lists based on location information in the database, and our employees and volunteers check and correct locational information so that our shelves match our database. Due to problems with the Specify software, we were unable to access the database through much of

2019. We have been working to update taxonomic information and addressing user access issues. In 2020, we hope to complete cross-checking of inventory information with the Specify database. We will also upload all new and updated information into Specify, to ultimately incorporate the digitized specimen element inventories.

Given the database issues, we focused on other curation issues for much of 2019. To minimize the number of times that specimens need to be removed from the shelves to look for information to solve documentation questions as well as to digitize the element inventories stored in each box, we developed protocols to photograph every piece of paper in every box. In 2018, we concluded this documentation of nearly 3,000 mammalian specimens, and we also created and digitized bone element inventories for new specimens added to the collection since the conclusion of the main inventory project. In 2019 we completed photographing the documentation for our avian specimens and identified specimens in need of bone element inventories. We expect to complete photo documentation of reptiles and amphibian information in 2020. One of our research assistants also used the Epson Scanner at the Scholars' Commons Digitization Lab in the Wells Library to digitize hundreds of color slides found in the lab that likely document photographs of our specimens before and after processing.

Volunteers and CBRC hourly employees also successfully completed the mammalian and avian bone element inventory data entry project: a total of 2,635 mammal inventories, 2,673 avian inventories, and 145 turtle inventories into Google Forms. We chose Google Forms because any of our students can enter the information from the element inventories by following a link and because it allows multiple simultaneous users. We began inventorying the reptile collection in late 2018. Crocodylians have been fully inventoried and the data entered into a reptile Excel spreadsheet. We created a detailed turtle osteology guide and are nearly finished with turtle inventories at the end of 2019. We will continue with lizards, snakes, salamanders, and frogs in 2020. In 2019, we also completed scanning our paper accession records. These records can now be associated with specific specimens in the database to help provide missing information on their life histories. All of our digital files are now stored on Box @ IU, a free cloud-based storage environment. In 2019, we moved all files stored on the GEODE server to IU Box. In 2020, we will be applying text recognition software to make the information easily searchable.

### ***Additions to the Collection***

The William R. Adams Zooarchaeology Laboratory continues to add to the comparative collection on a targeted acquisition basis. The addition of specimens to the collection is an ongoing process that provides research and volunteer opportunities in the laboratory. The comparative collection is at the heart of the William R. Adams Zooarchaeology laboratory and is the only way all of our projects, research, and teachings are possible. It is critical that we continue to selectively add specimens in order to strengthen our collection in both taxa and demographic coverage. Additionally, new specimens provide us the opportunity to curate skeletons with a more complete biological profile that includes live weights and measurements, life histories, and other datasets which expand the collection's utility beyond archaeological investigations.

During 2019, new accessions and processing projects were deliberately limited to allow staff and volunteers to concentrate their efforts on the inventory, rehousing, and digitization projects. We strengthened our relationship with the Indiana Department of Natural Resources for



the donation of specimens from their wildlife management efforts. Dr. Scheiber made connections with the furbearing wildlife biologist and the migratory bird biologist in late 2019. We look forward to a steady stream of new specimens coming from them in 2020. We also have a working relationship with the Indiana Health Department who can donate specimens that require rabies testing. In 2019 we expanded opportunities for volunteers to train in processing techniques, allowing for all of the specimens in our walk-in freezer to be accessioned so that we can better track individuals as soon as they come into our facility.

### *2019 Specimens Accessioned*

In 2019, we accessioned 123 new specimens (mostly from the walk-in freezer), represented by various species of snakes, mollusks, fish, birds, and mammals. Thirty three snakes of various species, donated by the Toledo Zoo in 2011, were accessioned in October of 2019. Twenty seven mollusks, donated by the Peoria Tribe Aquatic Facility, were accessioned in January of 2019. Additionally, twenty three fish, eighteen birds, sixteen mammals, and one non-avian reptile were accessioned. All specimens placed in the lab's walk-in freezer in 2020 will be accessioned with the help of volunteers as soon as they come into the facility in order to establish a consistent process for lab accessions, maintain accurate lab records of accessions, and teach students and volunteers proper collection management strategies.

### *Center for Biological Research Collections*

Along with colleagues from the Department of Earth and Atmospheric Sciences (EAS) (formerly Geological Sciences) who curate the IU Paleontology Collection, we continued our collaborative venture, the Indiana University Center for Biological Research Collections (CBRC). The CBRC is funded by the College of Arts and Sciences and the Office of the Vice Provost for Research with partners in Anthropology, Geological Sciences, Biology, the School of Education, Digital Library Program, Advanced Visualization Lab, Research Technologies Division of UITS, and the Pervasive Technology Institute. It promotes the use of instruments that can rapidly produce three dimensional scaled digital models of specimens in research collections in order to facilitate digital research, novel 3D visualization techniques, forensic reconstructions, digital archive development, and dissemination of specimen-based research data on a web application. Our executive director for the last several years has been Dr. David Polly. When Dr. Polly became the chair of EAS in fall of 2019, Dr. Claudia Johnson was selected as our new executive director of CBRC. Dr. Polly, Dr. Johnson, and Dr. Scheiber form the CBRC executive committee.

The CBRC provided funding for a lab manager in 2019 to manage the daily activities in the laboratory, a job that is crucial for all activities described in this report. In fall 2019, a full-time staff person Dr. Jess Miller-Camp was appointed in a permanent role as ½ time lab manager in Zooarchaeology and ½ time lab manager in Paleontology. Funds for several hourly undergraduates to assist the manager and director with organizational upgrades within the collection continued to be allocated to WRAZL.

### *CBRC Executive Committee*

**Claudia Johnson** is a Professor in Earth and Atmospheric Sciences and Research Curator of the IU Paleontological Collection. She received her BA in Geological Sciences from the University of Colorado, Boulder, in 1981, her MS in Geological Sciences from the

University of Colorado, Boulder, in 1984, and her PhD from the University of Colorado, Boulder, in 1993. She is the Associate Director of the IU Center for Underwater Science and the current director of the Center for Biological Research. In spring 2019 she was selected as a Geological Society of America Fellow in recognition of her distinguished contributions to the geosciences. Her research focuses on the evolutionary history of the reef ecosystem, from ancient to modern, to evaluate tropical biodiversity fluctuations under Earth's changing climate regimes.

**P. David Polly** is the Robert R. Shrock Professor of Sedimentary Geology, Earth and Atmospheric Sciences. He received his BA in the Plan II Honors Program at the University of Texas, Austin, in 1987 and his PhD in Paleontology from the Department of Integrative Biology at the University of California, Berkeley, in 1993. He is the Research Curator of the IU Paleontological Collection, the Department Chair of Earth and Atmospheric Sciences, and the Immediate Past President of the Society of Vertebrate Paleontology. Polly's research focuses on quantitative evolution, phylogeny, and paleoecology of vertebrates. Much of his work has been on the phylogenetics and functional evolution of mammals, especially Carnivora and Creodonta, on the correspondence between phenotypic and genetic differentiation, on the role of functional traits in structuring mammalian communities, and on the evolution of multivariate quantitative morphological traits.

**Laura L. Scheiber** is an Associate Professor of Anthropology and the Director of the William R. Adams Zooarchaeology Laboratory. She received a BA in Anthropology from the University of Wyoming in 1990, an MA in Anthropology from the University of Wyoming in 1993, and a PhD from the University of California, Berkeley, in 2001. Her research focuses on zooarchaeology, North American archaeology and ethnohistory, and culture contact studies. She is also the director of the American Indian Studies Research Institute, where she supervises a team working with indigenous tribal members on issues of culture, heritage, and language. Through her archaeological research program, Bighorn Archaeology, she has trained hundreds of students in field techniques, creative partnerships, and transnational politics.

### *3D Scanning and Digitization*

The William R. Adams Zooarchaeology Lab is dedicated to keeping up to date with the continually evolving world of collection management. We continue to keep digitization efforts on our priority list and on the forefront of our mission. We hope students who participate in digitization projects in our lab will use this experience to increase their skill sets and help them gain proficiency in the latest 3D scanning technology and ultimately visualize ways that three-dimensional data can be used to answer research questions. We believe these training opportunities benefit our volunteers and students by adding to their credentials and making them more attractive to employers and graduate programs.

As CBRC affiliates, we have housed three different 3D laser scanners over the last several years to facilitate digital research on the collections of the William R. Adams Zooarchaeology Laboratory and Indiana University Paleontology Collection. We established a dedicated scanning station in the WRAZL workspace. In 2014, the CBRC purchased a FaroArm laser scanner, which we moved to Paleontology two years later in favor of more user-friendly and portable scanners that are shared across units. These machines were selected for their combination of flexibility in scanning and software packages. The software allows our undergraduate volunteers and employees to engage with the machines with less vigorous training. Scanning and processing data to create models with the FaroArm could take 20-30

hours per object, whereas with the new scanners a user can soon become proficient enough to cut the time down to about an hour per specimen. This increases our use of the equipment and aids researchers in their specimen-based research in the CBRC zooarchaeology and paleontology collections.

In 2019, our current scanners were a Go!Scan20 and a Go!Scan50, the use of which were reserved through the University Information Technology Services (UITs) Advanced Visualization Laboratory. They each have designated laptops capable of quickly processing high-density point clouds for the rapid creation of 3D models. Laboratory staff, volunteers, and researchers use the scanners to scan objects for use as digital comparatives. Additionally, we are employing photogrammetry to compare and contrast its efficacy in capturing bone morphology and artifact details. We also use photogrammetry to document artifacts and features associated with the Bighorn Archaeology field projects and with presentations such as Cheryl Munson's plummet scan presented at the Midwestern Archaeological Conference. Models are uploaded to the lab's online sketchfab account. In 2016, we installed Agisoft's Photo Scan program on the lab's desktop computers. This software allows volunteers to construct 3D models on a machine that has the capability to expedite the process (as opposed to student and staff personal laptops). We also consult with software experts at the Center for the Analysis of Social-Ecological Landscapes (CASEL), which brings together faculty and students from multiple areas of expertise to collaborate on the study of human-environment interaction.

In the fall of 2018, we requested additional training on the use of the scanners from UITs technical support staff member Jeff Rogers. He led a workshop in the lab to train staff and volunteers in the use of the Go!Scan technology. We also began drafting procedural instructions for our use of 3D scanners. We anticipate expanding these efforts in 2020, especially in working with the Cyberinfrastructure for Digital Humanities & Creative Activities group to develop more efficient work flows to run batch jobs using one of the IU supercomputers. We also anticipate the permanent transfer of the Go!Scan 20 from UITs to WRAZL.

### ***Lab Maintenance and Upgrades***

In the summer of 2014, we scanned certain specimens in the lab using a portable XRF machine that we borrowed from the IU NAGPRA office. This investigation was conducted to determine the chemical analysis of our taxidermy specimens as well as desks and tabletops. Trace amounts of arsenic were observed in some of the cabinetry in the laboratory. We began working with the appropriate services within the university to address the removal and rebuilding of some of the shelving in the lab. In 2015, we removed two large contaminated shelving units, and the Department of Anthropology replaced them with units attached to the wall made of non-toxic, easily sanitized materials. We continue to monitor the taxidermy specimens. In the spring of 2018, the Anthropology Department, working with the IU Architect's Office, assisted us in replacing a contaminated wooden desktop at one of our computer stations and in installing a splash guard at the sink. This will be an ongoing monitoring and removal process as we continue to strive for the most current and safe curation methods.

We increased the number of desktop computer stations from four to five in 2017, including installing three new Dell desktops. This was part of lifecycle replacement and assists everyone making changes to online databases and forms, as well as allowing more students to work at desks in the lab. Our CBRC project coordinator and lab manager are the administrators on four of these machines. The wireless signal in the basement of the Student Building remains

strong. We additionally moved one of the Anthropology Department's microscopes into the lab so that students and researchers can better analyze bone surface modifications using high-powered magnification. This Meiji Techno EMZ-13TR 1.0X -7.0X trinocular zoom stereomicroscope has a fiber optic LED light source and a camera attachment for digital still and video data capture.

## ***Section B: RESEARCH AND OUTREACH***

### ***Outreach Efforts***

Laboratory personnel are involved in numerous public outreach events for the campus and wider community. In 2019, laboratory volunteers and staff partnered with the WonderLab Museum of Science, Health & Technology, the Glenn A. Black Laboratory of Archaeology, the Center for Integrative Study of Animal Behavior, the Center for Underwater Sciences, the Plains Anthropological Society, and more. They provided expertise on animal anatomy and allowed students and community members the opportunity for hands-on science educational experiences with comparative specimens from the collection. We additionally hosted several public events in the lab. We continue to be a resource for assisting with the identification of unknown bones for the Bloomington and Indiana University Police Departments, researchers at Indiana University, and the public. The lab director has been part of ongoing conversations with a number of other IU organizations about future collaborations, including the Sage Collection; the Science, Technology, and Research Scholars (STARS) Program; the Cox Scholars Program; and the IU-MSI STEM Initiative.

#### ***Buffalo Nation: The Archaeology and Ethnography of an American Icon***

Buffalo Nation was taught by Dr. Laura Scheiber in spring of 2019. It is a class that is intended for students interested in the mighty buffalo, graduate students in the food and anthropology concentration, undergraduates in the food anthropology minor, and undergraduate and graduate students in the Native American and Indigenous Studies programs, and undergraduates who have previously enrolled in zooarchaeology. Nine students and a faculty member participated in the class. Students followed the history of the buffalo from its evolution during the Ice Age to the dominant food source on the Plains thousands of years ago to a modern meat served in restaurants in the Midwest. The class was divided into three sections: subsistence and acquisitions, butchering, and modern cuisine. In each section, students read and discussed both archaeological and ethnographic case studies, as well as had a few hands-on opportunities in order to learn the natural and ethnographic history of the buffalo. Exercises included identifying bison bones, experimental butchering with stone tools, and a bison-centric cooking project. Dr. Olga Kalentzidou graciously facilitated the use of the food lab/kitchen controlled by the Geography Department for this event.

#### ***Center for the Integrative Study of Animal Behavior***

The IU Center for the Integrative Study of Animal Behavior (CISAB) administers the undergraduate major in Animal Behavior at Indiana University. The William R. Adams Zooarchaeology Laboratory often partners with CISAB on a variety of events and activities. Their staff assistant Charli Taylor is one of our former WRAZL superstars, and we enjoy

collaborating whenever possible. In 2019, we coordinated with them on several outreach events, including the “Majors, Minors, and More” fair and the Bloomington Project School Science Fair. We additionally hosted numerous Animal Behavior undergraduate majors as volunteers and interns in the lab.

#### *Center for Underwater Science*

The Kappa V site (12MO301) is a multi-component archaeological campsite located in the Charles C. Deam Wilderness in the Hoosier National Forest. Listed on the U.S. Register of Historic Places, it is considered one of the most important archaeological sites in southern Indiana. Much of it is now unfortunately underwater due to the construction of Lake Monroe. Four members of the WRAZL team (including Dr. Scheiber, Amanda Burt, Thomas Brimm, and Madison Hinkle) joined staff and students from the IU Center for Underwater Sciences (including lab affiliates, Samuel Haskell and Kirsten Hawley) on April 5, 2019, to conduct an assessment survey and archaeological reconnaissance of possible submerged archaeological materials of Kappa V. We met at the pontoon boat rental at Paynetown Campground and crossed Lake Monroe to reach the site, where we walked along the shoreline to determine if archaeological materials were eroding from the water’s edge. We also collected several catfish specimens on the beach for the lab’s comparative collection while we were there.

#### *Central Middle School*

For many years, teachers at Central Middle School in Columbus, Indiana, have brought their eighth-grade science students to Indiana University to show their students a science laboratory at a major institution and what kind of work we do at the William R. Adams Zooarchaeology Laboratory. This year they brought 44 students on April 5, 2019. They visited multiple laboratories of various disciplines as well as the media school to highlight the many avenues of science that their students could potentially follow.

#### *Earth and Atmospheric Sciences*

One of our most obvious points of outreach and collaboration is with the Department of Earth and Atmospheric Sciences (EAS), which is the academic home to the other two faculty members of our CBRC executive committee, the location of the IU Paleontology Collection, and the hiring unit of our Laboratory Manager. In 2019, we also collaborated with EAS postdoctoral research fellow Christina Friberg, on a pilot research project. The department additionally graciously loaned us their fleet of pvc plastic poster stands for use at the 2019 Plains Anthropological Conference. We also worked with staff from the Indiana Geological and Water Survey on researching connections between Dick Adams, our lab, and Pleistocene sloth remains for the Bicentennial project on recreating “Megajeff.”

#### *Eskenazi School of Art, Architecture + Design*

WRAZL connected with several faculty members from the School of Art, Architecture + Design in 2018, hosting dozens of students from numerous classes in the lab during the Animal/Human Semester. In 2019, sculpture faculty member Melanie Pennington audited Dr. Scheiber’s Buffalo Nation class. Melanie and Dr. Scheiber are in conversations about future collaborations, including sculpture students assisting with re-designing mounts for the articulated skeletons and a buffalo art exhibit.

### *Glenn A. Black Laboratory for Archaeology*

We continue to work closely with the IU Glenn A. Black Laboratory of Archaeology (GBL). We collaborate on identification of faunal remains, specimen loans for teaching, and loans for relevant exhibits. The William R. Adams Zooarchaeology Lab also houses archaeological collections that represent previous, current, and future research projects. For instance, we curate several archaeological collections that represent Dick Adams' many years as an active archaeologist. We continue to value our affiliation with the GBL as we have common missions and goals that include caring for and protecting research collections.

Dr. Scheiber served on the Glenn Black Laboratory external review committee in 2017 and is currently a member of their advisory board. Our former lab manager Amanda Burtt is currently an Associate Curator and Project Staff Supervisor at the GBL. In 2018, we worked with the Glenn Black Laboratory curators on developing their *Animal-Spirit-Human* exhibit as part of the Animal/Human Themester project. Amanda designed the display "Domestic Dog Diets at Angel." They also consulted with us to create the "Finding and Identifying Animals from Angel Mounds" museum display outside of our lab. These exhibits remained on display through 2019. We plan to strengthen this collaboration in 2020 by developing a faunal type-collection of material housed at GBL.

In September 2018, the GBL was awarded a "Save America's Treasures" grant to rehabilitate and rehouse 2.8 million artifacts from the Angel Mounds State Historic Site over the next 3 years. These grants are administered by the National Park Service in partnership with the Institute of Museum and Library Services. The "Curating Angel" project provides safe, long-term preservation of the artifacts and associated documentation from archaeological work at Angel Mounds and makes these collections more accessible for research and education. The Curating Angel Team, led by Amanda Burtt, has rehoused 440 boxes of Angel faunal material. Amanda requested a loan of numerous WRAZL comparative specimens for use at the GBL during the project.

### *Majors, Minors, and More*

In August of 2019, two of our lab staff, Samantha Couch and Thomas N.Z. Brimm, assisted the IU Anthropology Department at the "Majors, Minors, and More" Fair. They added a strong focus on the William R. Adams Zooarchaeology Laboratory to the event. They brought several specimens from the lab and demonstrated examples of skeletal analysis and morphological differences from a wide variety of WRAZL specimens. The staff also helped to spread the word of WRAZL to potential students and volunteers, explaining who we are and what we do in the lab to at least 100 students.

### *Monterey Bay Aquarium*

In December of 2019, Assistant Lab Director Sam Couch visited the Monterey Bay Aquarium in Monterey, California, to establish a relationship for future specimen donations. The Aquarium is a leader in ocean conservation and education, with over 200 exhibits and 35,000 creatures. After her successful visit, Sam collated a list of nearly 200 fish, bird, and marine mammal species currently at the Aquarium that we are missing or are poorly represented in the WRAZL collections. We plan to submit a formal research request to them in 2020.

### *Natural History Collections Club (NHCC)*

Following the Society for the Preservation of Natural History Collections Conference in May, staff chose a student president, Kimberly Cook, and filed the necessary paperwork to establish a Natural History Collections Club at IU. The first meeting was held at WRAZL in November 2019 during which participants established the goals and priorities of IU's chapter, which include service projects in each of the natural history collections on campus (WRAZL, Paleontology, Herbarium) with potential for field excursions to natural history collections outside of IU (WonderLab Museum's living collection) as well as creating information exhibit content utilizing the collections at IU. Moving into 2020, the club will write up their constitution and begin establishing times to visit IU collections.

#### *Office of the Native American Graves Protection and Repatriation Act*

The Indiana University Office of the Native American Graves Protection and Repatriation Act (NAGPRA) works to create partnerships, establish lines of communication, and developing fruitful relationships with indigenous communities across the U.S. so that ancestral remains and funerary objects can be returned to appropriate tribal communities. IU currently houses large collections of human remains and cultural items from archaeological sites across the country, particularly from Indiana and Illinois. Several hundred ancestors and their associated funerary objects are from the Angel Mounds site. Since 2018, Amanda Burt has worked as a faunal analyst on the NAGPRA project to rehouse and organize animal remains that are potential associated funerary objects. WRAZL has made available our comparative collection for assistance in this task.

#### *Office of the Indiana University President Initiatives*

In 2017, IU President Michael McRobbie invited the Zooarchaeology lab director to participate in a collections summit to discuss shared issues of mission, storage, digitization, staffing, programming and exhibition, accession and deaccession, and other policy challenges associated with material collections. One result of the summit is the formation of a working group of dozens of collections managers across many of the IU campuses. In the fall of 2018, the University hired Heather Calloway as IU's first executive director for university collections. When the power went out across campus in September 2019, we lost electricity to our walk-in freezer. Dr. Calloway was extremely helpful in assisting us with biosafety issues associated with this failure. We look forward to working more closely with her in 2020.

In the spring of 2018, President McRobbie asked Dr. Scheiber and the other executive committee members of the CBRC to serve on the McCalla Committee. Our charge was to examine the feasibility of creating a Natural History Research Center (NHRC) as an outstanding opportunity to ensure that IU's scientifically important natural history collections are properly housed, maintained, curated, and fully utilized in their four-part mission of preservation, research, education, and public engagement. One of the possible options for space included the McCalla Building, located in a prime location just steps away from the Glenn Black Lab. To date, the President has not responded to our summary document, but we are deeply grateful that the long-term health and vibrancy of our IU collections is one of his top priorities.

#### *Peoria Tribe of Indians Aquatic Facility*

In November of 2018, WRAZL staff met environmental specialist Justin Downs, a representative of the Peoria Tribe of Indians of Oklahoma who was speaking on campus for a panel discussion "Animal-Spirit-Human" hosted by the Glenn A. Black Laboratory of

Archaeology. Justin works for the Peoria Tribe's fish hatchery and mollusk aquaculture facility. During a tour of the William R. Adams Zooarchaeology Laboratory, he offered to provide us with specimens from his facility. Through this connection, we were able to obtain 27 freshwater mollusk specimens of sixteen different species in January of 2019. Upon arrival, staff inventoried and bagged the collection, naming it the Peoria Indian Tribe of Oklahoma. This relationship will continue for the foreseeable future as they obtain new species that get added to the collection.

#### *Plains Anthropological Society*

The Plains Anthropological Conference is an annual event held by the Plains Anthropological Society that promotes research and scholarship in culture and history of the North American Great Plains. The membership selected our bid to hold the 77<sup>th</sup> Annual Plains Anthropological Conference in Bloomington, Indiana, October 16-19, 2019. The event brought together over 200 scholars from 55 institutions. It was organized by WRAZL director Dr. Laura Scheiber and co-organized by lab affiliate Amanda Burtt. The William R. Adams Zooarchaeology Laboratory was one of the official sponsors of the event. Numerous volunteers and staff in the lab assisted with organization and preparation. They also served as members of the welcome committee and were available to answer questions about Bloomington, Indiana, and the Society. Several researchers also presented papers about our work in the lab.

#### *Pre-College Research Experience Program*

Since 2016, we have connected with Indiana University's Pre-College Research Experience Program (PREP) run through the Office of Science Research to offer volunteer opportunities to high school students. In 2019, two high school students each volunteered for several hours every week. They spend their volunteer hours working with program mentor Amanda Burtt, learning about the vertebral skeletal system. We are excited about both of these students' continued involvement with the laboratory. As they think about college and life after high school, we look forward to supporting their efforts and providing letters of recommendation for any post high school opportunities they pursue.

#### *Redbud Hills Retirement Community*

The granddaughter of the founder and namesake of the William R. Adams Zooarchaeology Laboratory, Hannah Cain, currently serves as the Activities Director at Redbud Hills Retirement Community in Bloomington. In July of 2019, she brought a group of residents from the retirement community for a tour of WRAZL. They reviewed original accession records and numerous animal skeletons. Dr. Scheiber helped organize a holiday photo booth for their residents as part of a high school service learning project in December.

#### *Society for the Preservation of Natural History Collections*

The Society for the Preservation of Natural History Collections is an international organization devoted to the preservation, conservation, and management of natural history collections. They met for their annual conference May 25-31, 2019, in Chicago, Illinois, hosted by the Field Museum. Funding was provided to send several employees and students to attend the conference with the intention of learning how to establish a Natural History Collections Club at Indiana University and to provide opportunities for IU students to gain experience working with a variety of collections. Staff attended several sessions and discussions related to this goal.



Dr. Miller-Camp presented a paper titled *Patchwork Patterns and Widescale Worth: Small Paleontology Museums are Local Linchpins. Stump Family*

The Stump family kindly loaned the Bechtel mastodon specimens to the William R. Adams Zooarchaeology Laboratory in 2015. In July of 2019, the family visited the lab to see the mastodon and we pulled out numerous specimens of other animals for them. Tish Bechtel Stump, her husband, and their six grandchildren of elementary through high school age, were present for the tour. They brought an additional element from the mastodon to leave on loan to the lab.

#### *The Bloomington Project School*

The Bloomington Project School is a K-8 independent charter school located in Bloomington, Indiana. With an emphasis on social justice and environmental sustainability, nearly 300 students attend the school in the heart of downtown. The William R. Adams Zooarchaeology provides animal bones for school activities and science fairs whenever possible. In October 2019, we loaned several specimens to the Center for Integrative Study of Animal Behavior for use in their presentation at the Bloomington Project School's Fall Enrichment Program.

#### *University of Indianapolis*

Sean Coughlin, project archaeologist at Ball State University, was hired by the University of Indianapolis to teach a special topics course on Zooarchaeology for the fall semester, 2019. Lacking a comparative collection to use to teach the class, Sean reached out to the William R. Adams Zooarchaeology Laboratory about borrowing specimens to use for teaching the students in his class. We were able to loan him several specimens from our teaching collection that ensured the success of his class.

#### *WonderLab Museum of Science, Health & Technology*

The WonderLab Museum of Science, Health & Technology is an award-winning non-profit science museum located in downtown Bloomington. It provides opportunities to experience the wonder and excitement of science through interactive exhibits and programs that stimulate curiosity, encourage exploration, and foster lifelong learning. The William R. Adams Zooarchaeology Laboratory continued collaborating with the WonderLab in 2019, thanks in large part to Samantha Couch, our assistant lab manager and their Animal Exhibits manager. She encouraged her student interns who wanted more lab experience to volunteer in the lab, leading to several new engaged Animal Behavior majors working with us. In June she taught the WonderCamp Animal MD program at the lab to 21 fourth through sixth graders. They toured the lab and spoke with Amanda Burt about what it means to be a zooarchaeologist and field researcher. In 2020, Sam will bring two groups of WonderCamp students to the lab, ranging from fourth through eighth graders.

#### *WRAZL Hosted Events: IU Day*

The William R. Adams Zooarchaeology Laboratory is located in the basement of the Student Building, which gets a lot of traffic because of all of the classes that are held on that floor during any one week of the academic year. On April 10, 2019, WRAZL participated in IU Day, a day of celebration of IU and IU affiliates. IU Day reached over 8 million people through social media and other venues. People spanning six continents came together to celebrate Indiana

University. Thousands of students participated in events on and around campus, including those who came into WRAZL to tour the lab and participate in a scavenger hunt of the collections.

During the 2019 celebration, WRAZL set up exploration stations displaying some of our more significant specimens, including the skull of a buffalo killed by Buffalo Bill Cody, Dick Adams original accession records, and representatives from all vertebrate classes. Throughout the day, staff also participated in the social media prompts sent out by Indiana University, including photos of staff in spirit wear, recreation of a historic photo of the lab, and a variety of photos highlighting specimens in the collection.

## ***Communication and Promotion***

### *Social Media*

We administer several social media accounts to connect to new and former students, as well as the interested public. We feature mystery bones and scanned three-dimensional images, information about current research projects, and show students working with the collection. As of the end of 2019, our Facebook page (@iuzooarch) had over 548 followers. Our Instagram account (@wrazl) has 161 followers. Our assistants collaborated on a list of daily hashtags such as #MuseumMonday, #TeachingTuesday, #WRAZLWednesday, and #MammalMadness to share the ongoing projects in the lab with our followers, which have proven to be particularly effective.

### *Websites*

Our website (<https://zooarch.sitehost.iu.edu/home.php>) was finally fully integrated from a private design server onto one of IU's servers in 2017. The process involved the replication and migration of the data onto the IU's server along with changing editing protocols to meet IU's security requirements. Editing procedures also shifted from a content management system to direct editing through Adobe Dreamweaver that allows WRAZL staff to have greater control of changes to the webpage as well as allowing for easier additions of current photos and better security. In fall of 2019, the University replaced its web hosting service Webserve with IU Sitehosting. We were required to enroll in the new account, which changed our url address. People searching for our website now encounter an error page unless they use the correct url. We plan to fix this in 2020.

In 2017, we also acquired an academic account for the 3D model website Sketchfab (@William\_R\_Adams\_Zooarch\_Lab) so that we could migrate the models from our previous, private account. We are updating the online descriptions so that the models can be better associated with the specimens in our collections and so that scholars will have an easier time contacting us with their specific needs.

### *Email*

We set up an email linked to our website account ([zooarch@iu.edu](mailto:zooarch@iu.edu)) in order to communicate with our volunteers and employees that are utilizing the collections in the lab. We also use the email to organize and communicate with potential new volunteers or researchers. Because of the graduate student assistant turnover through the years, we do not have consistent documentation of lab business. Forwarding old emails to the Zooarchaeology email allows us to better track collections questions.

### *Promotional Materials*

Our graphic element for the William R. Adams Zooarchaeology Laboratory features a stylized drawing of a bison skull from our own collection. This specimen was one of the first to be accessioned in the lab, and our records state that this bison was killed by Buffalo Bill Cody. We previously designed and printed WRAZL stickers using this graphic element. In 2019, Dr. Miller-Camp created a large poster featuring a realistic marker drawing based on this skull to draw people in on IU Day. It hangs above our chalkboard now and will be used for further events. In 2020 we will plan to design a promotional postcard for the lab.

### ***Hall Museum Displays***

Three large glass cabinets in the hallway outside the lab offer opportunities for outreach, education, and promotion. Our goal is to change the museum displays at least every two years. For all of 2019, the William R. Adams Zooarchaeology Laboratory offered a special exhibit in the hallway of the basement of the Student Building as part of the IU College of Arts and Sciences Animal/Human Themester, featuring animal populations in the collection that have been affected by human impacts, development, and preservation. Featured animals cover a variety of geographic places, animal types, unique histories, and efforts by humans to both eradicate and save animal species across the world. The designs were so popular that we decided to leave them in place through 2020.

The first display case features the exhibit “Finding and Identifying Animals from Angel Mounds” highlighted the role of our lab founder William R. “Dick” Adams in archaeological investigations at the Angel Mounds site in southern Indiana. Graduate student Amanda Burt, along with Dr. Scheiber, designed the content for this display, which features information about archaeology and faunal analysis through the years as well as original notebooks, tools, and Dick Adams’ 1949 type-written master’s thesis.

The students from Dr. Scheiber’s People and Animals class (COLL C104) helped design six other displays for our middle hall case. Students selected unique topics, including Dog Sledding, Food vs Pet, the Exxon Valdez Oil Spill, Overfishing, Global Warming, and Trophy Hunting. They collaborated to create posters filled with informative text and relevant pictures and charts. They also selected specimens from the WRAZL collection for display. For example, in the Exxon Valdez Oil Spill display, they selected a sea otter, harlequin duck, and tufted puffin from the collection killed in one of the worst oil spills in history. Students also set up the displays by hanging posters, adjusting shelves, and thoughtfully placing the specimens. Through engaged student involvement, our Themester display serves as both public outreach in addition to its educational value within the context of the class.

The last glass case is an informative display about impacts of modern ecotourism on coral reefs. Although we rotate the information contained within this display, we do not have space in the lab itself to house the large shells and corals so they are best stored in the hall cabinet. The current shells and corals display highlights our invertebrate collection as well as our partnerships with colleagues in Earth and Atmospheric Sciences who research coral reefs and with those in the IU Center for Underwater Science who seek to protect fragile underwater cultural and natural resources.

### ***Publications, Reports, Presentations, and Grants***

In 2019, laboratory affiliates published/had accepted 44 publications and reports; presented 44 professional conference papers, posters, and invited lectures; and organized 3 symposia. Several of us additionally filled leadership roles by planning and serving on host committees for two major conferences, including the Plains Anthropological Conference in Bloomington, organized by Dr. Scheiber. We also administered, coordinated, and collaborated on 12 grants based on ongoing research, as well as submitted three grant proposals for further funding. We currently are involved in several long-term research projects, which will facilitate additional future publications and presentations. We also re-instated the William R. Adams Zooarchaeology Laboratory account through the IU Foundation Account and plan to increase development efforts in 2020.

### *Publications*

The William R. Adams Zooarchaeology Laboratory is a collection of objects, but it is also a network of scholars invested in collections and curation issues, archaeology, biology, animal behavior, public outreach, digitization, and responsible research practices. Our publications and presentations cover a wide universe of topics that transcend the zooarchaeology laboratory space as a repository and represent scholastic and public efforts that are inspired and informed by our time in the lab.

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Buchanan, Meghan E., and Rob Bonney (*forthcoming*). **Distribution and (Re)Interpretation of Mississippian Copper Symbol Badges; Two Unpublished Examples from East Alabama**. *Southeastern Archaeology*. To be published in 2020.

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### Reports

WRAZL affiliates participate in numerous research ventures in which they are required to produce unpublished reports in their field to fulfill funding obligations and as conditions for

federal and state permits to conduct further investigations. In 2019, we contributed to six reports of investigations through our work with Bighorn Archaeology, IU Center for Underwater Science, and the Glenn Black Laboratory.

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Hawley, Kirsten M.(editor), Thomas N.Z. Brimm (contributor) (2019) **Evaluación Anual: Reserva Arqueológica Subacuática Guadalupe de 1724**. *Submitted to Dirección General de Patrimonio Cultural Subacuático, Dominican Republic. Spanish and English.*

Scheiber, Laura L. (2019) **Trout Creek Archaeological Survey Summary Report of Investigations, Shoshone National Forest, Park County, Wyoming, BHA2019-1**. *Report submitted to the Shoshone National Forest District Archaeologist.* Contributions by Thomas Brimm.

Watts Malouchos, Elizabeth, April Sievert, Chris Beam, Melanie Pope, Eric Carlucci, Amanda A. Burt, and Lauren Schumacher (2019) **Revealing Indiana University's Earliest Cultural Landscapes through Heritage Archaeology: The Results of Geophysical Survey and Excavation at the Wylie House Museum. Reports of Investigation 20-0, Glenn A. Black Laboratory of Archaeology, Indiana University, Bloomington**. *Report submitted to the Indiana Department of Natural Resources Division of Historic Preservation and Archaeology and the Indiana University Office of the Bicentennial.*

#### *Presentations*

WRAZL affiliates attended and presented research papers at sixteen conferences in 2019, throughout the United States and abroad. They reached audiences at local, regional, national, and international levels. The highest number of presentations occurred at the Society for American Archaeology Annual Meeting (6), the Society for Vertebrate Paleontology Annual Meeting (5), the Plains Anthropological Conference (4), and the Geological Society for America Annual Meeting (4).

Brimm, Thomas N.Z. **Dive into Taíno History: Underwater Archaeology in the Caverns of the Dominican Republic, Padre Nuestro**. *Presented at the Crossroads Conference, Bloomington, Indiana, March, 2019.*



Buchanan, Meghan E., and Rob Bonney. **Two Newly Discovered Copper Arrow Symbol Badges from East Alabama: Old Collections, New Interpretations.** *Presented at the Southeastern Archaeological Conference, Jackson, Mississippi, October, 2019.*

Buchanan, Meghan E., and Elizabeth Watts Malouchos. **Just a Grog Sherd Livin' in a Shell World.** *Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Burt, Amanda A. **Ripe for Research.** *Invited Participant in "Rediscovering Angel Mounds." Presented at the Plains Anthropological Conference, Bloomington, Indiana, October, 2019.*

Burt, Amanda A., and Larisa R.G. DeSantis. **Unlikely Allies: Modern Wolves and the Diets of Pre-contact Domestic Dogs on the North American Plains and Rocky Mountains.** *Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Burt, Amanda A., and Larisa R.G. DeSantis. **Zooarchaeology Analysis and Contending with Variation in Natural History Collections.** *Presented at the Indiana Academy of Science Annual Meeting, Indianapolis, Indiana, March, 2019.*

Dodds, Tricia J., and Kirsten M. Hawley. **Preliminary Investigation of the Glenn Mayne Shipwreck.** *Invited Participant in "Advances in Maritime Archaeology." Presented at the Society for California Archaeology Annual Meeting. Sacramento, California, March, 2019.*

Galloway, Tori, Matthew Lawrence, Charles Beeker, Samuel Haskell, and Kirsten Hawley. **Documenting Historic Shipwrecks in the 21st Century: Using New and Old Data to Support Monitoring of the 1733 San Pedro and San Felipe.** *Presented at the Society for Historical Archaeology Meeting, St. Charles, Missouri, January, 2019.*

Haskell, Samuel I., Matthew Lawrence, Charles D. Beeker, Kirsten M. Hawley, and Tori Galloway. **30 Years Later: Revisiting the 1733 San Pedro Underwater Archaeological Preserve and San Felipe Shipwreck Sites in the Florida Keys.** *Presented at the Society for Historical Archaeology Conference, January, 2019.*

Hawley, Kirsten M., Charles D. Beeker, Denise T. Jaffke, Samuel I. Haskell. **SS Pomona Shipwreck—Past and Current Investigations.** *Invited Participant in "Advances in Maritime Archaeology." Presented at Society for California Archaeology Annual Meeting. Sacramento, California, March, 2019.*

Hawley, Kirsten M., Charles D. Beeker, Matthew Maus, Samuel I. Haskell. **Living Museums in the Sea: The Past, Present, and Future of Underwater Cultural Heritage Preservation.** *Presented at the Society for Historical Archaeology Conference, St. Charles, Missouri, January, 2019.*

Hawley, Kirsten M., and Laura L. Scheiber **Spatial Data Analysis and Visualization Techniques of Shoshone Occupations in the Washakie Wilderness of Northwestern**

**Wyoming.** *Presented at the Plains Anthropological Conference, Bloomington, Indiana, October, 2019.*

Hawley, Kirsten, Laura L. Scheiber, and Amanda Burt **Visualizing Mountain Shoshone Occupations in the Washakie Wilderness of Northwestern Wyoming.** *Invited Participant in “New and Ongoing Research on the North American Plains and Rocky Mountains.” Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Hellert, Spencer, P. David Polly, and Daniel P. Rhoda. **Evolutionary Constraint of The Diversification of Avian Limbs.** *Presented at the Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Kearney, John C., and Claudia C Johnson **Using Phenocryst Compositions to Discriminate Tuffs of Bed III and Younger, Olduvai Gorge, Tanzania.** *Presented at the Geological Science of America Annual Meeting, Phoenix, Arizona, September, 2019.*

Kennedy, J. Ryan. **19th-century Chinese Migration and the Pacific World Fish Trade.** *Presented at the Fish Remains Working Group Meeting, Portland, Oregon, August, 2019.*

Kennedy, J. Ryan, and Jinhua (Selia) Tan. **The Cangdong Village Project: An Examination of the Transnational Lives of Chinese Migrants.** *Presented at the International Symposium on the Transnational Life of Chinese Railroad Workers in North America at Wuyi University, Jiangmen, China, June, 2019.*

Kennedy, J. Ryan, and Leland Rogers. **A Piece of Salted Snakehead and Its Implications for the Nineteenth-Century Chinese Diaspora Fish Trade.** *Invited Participant in “One of A Kind: Approaching the Singular Artifact and the Archaeological Imagination.” Presented at the Society for Historical Archaeology Annual Meeting, St. Charles, Missouri, January, 2019.*

Kennedy, J. Ryan. **Zooarchaeological Perspectives on Tradition, Trade, and Entrepreneurialism in the 19th-Century Chinese Diaspora.** *Presented for the Syracuse University, Department of Anthropology, October 25, 2019.*

Kort, Anne E., **An Early “Cat Gap”? An Evaluation of Oxyaenids as Ecological Analogues of Felids.** *Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Kort, Anne E., and Nicholas A. Fomoso. **Updating Prospecting Practices with GIS at John Day Fossil Beds National Monument.** *Presented at the Geological Society of America Annual Meeting, Phoenix, Arizona, September, 2019.*

Miller-Camp, Jess. **Alligatorine Diversity Dynamics Support the Common-Cause Hypothesis of Macroevolutionary Patterns in The Rock Record.** *Presented at the Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Miller-Camp, Jess. **Deposition, Climate, and Diversity: Alligatorines as a Case Study of the Common-Cause Hypothesis.** *Presented at the North American Paleontological Conference, Riverside, California, June, 2019.*

Miller-Camp, Jess. **Patchwork Patterns and Widescale Worth: Small Paleontology Museums are Local Linchpins.** *Invited Participant in “No Collection Left Behind: Research Contributions of Small Collections.” Presented at the Society for the Preservation of Natural History Collections Annual Meeting, Chicago, Illinois, May, 2019.*

Miller-Camp, Jess. **Squee! Ahhh! What, no!?! And Other Reactions to a Fuzzy Rock.** *Presented at the Society for the Preservation of Natural History Collections Annual Meeting, Chicago, Illinois, May, 2019.*

Miller-Camp, Jess, and Cynthia Crane, **Small to Mid-size Natural History Museums as Pillars of Their Communities.** *Presented at the Association for Materials and Methods in Paleontology Annual Conference, Hays, Kansas, April, 2019.*

Pearson, Alannah. P. David Polly, and Emiliano Bruner. **Temporal Lobe Variation in Extant and Fossil Old World Monkeys (Catarrhini, Cercopithecoidea).** *Presented at the Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Polly, P. David. **The Assembly of Cat Communities in the New World: Ecometrics and Neogene Faunal Turnover.** *Presented at the Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Rhoda, Daniel P., Spencer Hellert, P. David Polly. **Shifting Patterns of Functional Integration During the Evolution of Flight in Theropods.** *Presented at the Society of Vertebrate Paleontology Annual Meeting, Brisbane, Australia, October, 2019.*

Scheiber, Laura L. **Legacies, Genealogies, and Inheritance: The American Indian Studies Research Institute as Repository.** *Invited Participant in “Perspectives in Plains Anthropology and Linguistics: Papers in Honor of Douglas R. Parks.” Presented at the Plains Anthropological Conference, Bloomington, Indiana, October, 2019.*

Scheiber, Laura L. **Native Narratives and Settler Colonialism in the Rocky Mountain West.** *Invited Participant in “Recognizing and Recording Post-1492 Indigenous Sites in North American Archaeology.” Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Scheiber, Laura L. **Native Voices in Cody, the Untold History.** *Invited Participant at the Heart Mountain Pipe Ceremony, Cody, Wyoming, June 9, 2019.*

Seifers, Ryann. **Intersections of Identity, Health, and Diet in the Wyoming Territory.** *Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Steussy, Clara. **Celebration: Expanding the Story of the Heart Mountain Haiku Stone.** *Presented at the Plains Anthropological Conference, Bloomington, Indiana, October, 2019.*

Steussy, Clara. **高峰/takamine/High Peak: Japanese-language Poetry at Heart Mountain.** *Presented at the Heart Mountain Internment Center, Powell, Wyoming, August, 2019.*

Sturgeon, Polly R., and Gary Motz. **Don't Throw Your Specimens Out of a Window: Resurrecting IU's Lost *Megalonyx jeffersonii*.** *Presented at the Society for the Preservation of Natural History Collections Annual Meeting, Chicago, Illinois, May, 2019.*

Sturgeon, Polly R., Nicholas Mowery, and Gary Motz. **Curating Authentic Experiences with Digital Objects Using Esri Story Maps.** *Presented at the Geological Society of America Annual Meeting, Phoenix, Arizona, September, 2019.*

Vanosdall, Wesley, Ryann Seifers, and Rick Weathermon. **The Body at the Washtub: A Bioarchaeological Reconstruction of Identity from a Purported 1849ers Oregon Trails Burial at Camp Guernsey, WY.** *Presented at the Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Zimmerman, Alexander N., Claudia C. Johnson, Nicholas W. Bussberg, and Mehmet M. Dalkilic. **Leveraging Machine Learning to Inform Spatial and Temporal Patterns in Deep-Sea Coral Biodiversity, Gulf of Mexico and US West Atlantic.** *Presented at the Geological Science of America Annual Meeting, Phoenix, Arizona, September, 2019.*

#### *Invited Lectures and Workshops*

Occasionally we also give lectures to classes of IU students and to local school children. In 2019, we were called as experts to speak at four events.

Brimm, Thomas N.Z., **Caves, Caverns, and Culture – Padre Nuestro, Parque Nacional del Este.** *Presented for the Underwater Science Research Class (SPH-K 550), Indiana University, Bloomington, Indiana, March, 2019.*

Burt, Amanda A., **Processing Mammals.** *Presented for the Buffalo Nation Class (ANTH P399), Indiana University, Bloomington, Indiana, March, 2019.*

Burt, Amanda A., **Zooarchaeology.** *Presented for the Animals M.D. WonderCamp, Wonderlab, Bloomington, Indiana, July, 2019.*

Scheiber, Laura L. **Mapping at Kappa V.** *Presented for the Underwater Archaeology Class (SPH-I 471), Indiana University, Bloomington, Indiana, April, 2019.*

#### *Organized Symposia and Events*

As a group, we are additionally active in organizing symposia at conferences and camp activities for elementary science education. In 2019, our affiliates organized two panels at major conferences and taught a youth camp that met at the lab.

Burt, Amanda A. **Rediscovering Angel Mounds.** *Plains Anthropological Conference, Bloomington, Indiana, October, 2019.*

Burt, Amanda A. **New and Ongoing Research on the North American Plains and Rocky Mountains** (co-organized with Brandi Bethke). *Society for American Archaeology Meetings, Albuquerque, New Mexico, April, 2019.*

Couch, Samantha. **Animals M.D.** *WonderLab Camp, WonderLab Museum of Science, Health & Technology, Bloomington, Indiana, July, 2019.*

#### *Conference and Committee Leadership*

The year 2019 witnessed a lot of time devoted to serving on organizing and planning committees for conferences and institutes. Our affiliates provided conference leadership for numerous organizations, such as the Plains Anthropological Society, the Society for Vertebrate Paleontology, and the IU Environmental Resilience Institute.

Brimm, Thomas N.Z. **Conference Committee Member, 77<sup>th</sup> Annual Plains Anthropological Conference.** *Bloomington, Indiana, October 16-19, 2019.*

Burt, Amanda A. **Co-Organizer and Conference Committee Member, 77<sup>th</sup> Annual Plains Anthropological Conference.** *Bloomington, Indiana, October 16-19, 2019.*

Miller-Camp, Jess. **Program Committee Member, Society of Vertebrate Paleontology Annual Meeting.** *Brisbane, Australia, October 9-12, 2019.*

Polly, P. David **Executive Committee Member, Society of Vertebrate Paleontology Annual Meeting.** *Brisbane, Australia, October 9-12, 2019.*

Polly, P. David **Steering Committee, Environmental Resilience Institute at Indiana University and Prepared for Environmental Change Grand Challenges Initiative.** *Bloomington, Indiana, 2017-Present.*

Scheiber, Laura L. **Organizer and Chair of Conference Committee, 77<sup>th</sup> Annual Plains Anthropological Conference.** *Bloomington, Indiana, October 16-19, 2019.*

#### *Grants*

External and internal funding is critical for the success of our research, teaching, and outreach missions of the lab. In 2019, we administered grants and contracts from 12 granting agencies. We additionally submitted three other grants.

Kravitz, Benjamin (PI). **Marine Sky Brightening: Prospects and Consequences.** National Science Foundation. Co-PI's: Claudia C. Johnson and Douglas MacMartin. \$299,994. 2019-2021.

Motz, Gary (PI). **ACCESSIONING at Indiana University: Promoting Digital Access and Discovery of the IU Paleontology Collection.** Institute of Museum and Library Services, Museums for America. Co-PI's: P. David Polly and Claudia Johnson, \$112,505. 2016-2019.

Motz, Gary (PI). **Digitization PEN: Paleoniches on the Western Cincinnati Arch, the Ordovician of Indiana.** National Science Foundation. Co-PI's: Claudia Johnson, P. David Polly, Jess Miller-Camp. \$149,387. 2017-2019.

Polly, P. David (PI). **ELT Collaborative Research: Bayesian Paleoclimate Proxies – Transforming the Vertebrate Fossil Record.** National Science Foundation EAR-1338298. Co-PI's: K. M. Johnson, S. C. Brassell, and A. Schimmelman; Collaborative PI: J. J. Head, University of Nebraska. \$168,394. 2013-2019.

Polly, P. David (co-PI). **Prepared for Environmental Change.** Grand Challenges Program, Indiana University. \$55 million. 2017-Present.

Scheiber, Laura L. (PI). **Nakóda Language Project, Stage 2.** Island Mountain Development Group. \$250,000. 2019-2020.

Scheiber, Laura L. (PI) **Indiana Digital Atlas of Osteology.** Institute of Museum and Library Services, Inspire! Grants for Small Museums. Co-PI: Jess Miller-Camp. \$49,995. 2020-2021. Submitted, under Review.

Scheiber, Laura L. (PI) **Establishing A Framework of Dog Feeding Practices Using Dental Microwear Texture Analysis Indiana Digital Atlas of Osteology.** National Science Foundation, Dissertation Improvement Grants. Co-PI: Amanda Burt. \$6,945. 2020-2021. Submitted, under Review.

Scheiber, Laura L. (PI) **Indiana Digital Atlas of Osteology.** Faculty Research Support Program, Indiana University. Co-PI's: Jess Miller-Camp, Claudia C. Johnson, P. David Polly, Gary Motz. \$40,000. 2019-2020. Submitted, Not Funded.

Scheiber, Laura L. (PI). **In the Shadow of Cedar Mountain: Archaeology at Apple Jack Ranch, Park County, Wyoming.** George C. Frison Institute for Archaeology and Anthropology, \$3,500. 2019-2020.

Scheiber, Laura L. (PI). **Assiniboine Language Documentation,** Center Pole Tribal Council, Fort Belknap Indian Reservation, Montana. \$90,000. 2019.

Scheiber, Laura L. (PI). **Bridge Funding for Assiniboine Language Documentation Research.** College of Arts and Sciences, Office of the Vice Provost for Research, and Office of the Vice President for Diversity, Equity, and Multicultural Affairs, Indiana University. \$90,000. 2018-2019.

Scheiber, Laura L. (PI). **American Indian Studies at Indiana University Documentation Project.** Indiana University Office of the Bicentennial, \$1,000. 2018-2019.

Scheiber, Laura L. (PI). **Nu’eta Language Documentation**. Fort Berthold Indian Reservation, North Dakota. Co-PI: Indrek Park. \$93,000. 2018-2019.

Sturgeon, Polly (PI). **Owen Up to the Truth: Uncovering the Hidden History of *Megalonyx jeffersonii* to Engage in Indiana University’s Natural History Collections**. Indiana University Office of the Bicentennial. Co-PI’s: Matthew Johnson, Gary Motz, Jennifer Lanman. \$25,000. 2018-2020.

### *Exhibits*

WRAZL affiliates curated numerous exhibits in 2019, both in the hallway in front of the lab and at the Glenn Black Laboratory of Archaeology. We often collaborate with colleagues in other units to increase visibility and output.

Burt, Amanda A. Co-Curator, **Animal-Spirit-Human Exhibit**, Funded through Indiana University’s 2018 Animal/Human Themester. Glenn A. Black Laboratory of Archaeology, 2018-2020.

Burt, Amanda A. Curator, **Dogs from Angel Mounds in Animal-Spirit-Human Exhibit**, Funded through Indiana University’s 2018 Animal/Human Themester. Glenn A. Black Laboratory of Archaeology, 2018-2020.

Burt, Amanda A. and Laura L. Scheiber Co-Curators, **Finding and Identifying Animals from Angel Mounds**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Dog Sledding**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Exxon Valdez Oil Spill**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Food vs Pet**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Global Warming**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Overfishing**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

Scheiber, Laura L. Curator, **Shells and Corals**, William R. Adams Zooarchaeology Laboratory, 2016-2020. Co-Curators: Claudia Johnson, Kirsten Hawley, Thomas Brimm.

Scheiber, Laura L. Curator, **Trophy Hunting**, Funded through Indiana University’s 2018 Animal/Human Themester. William R. Adams Zooarchaeology Laboratory, 2018-2020.

### ***Education, Support, and Specimen Loans***

The laboratory frequently allows IU instructors and educators to use the skeletal specimens curated at the William R. Adams Zooarchaeology Laboratory. Some of the lab's specimens are housed in other classrooms in the Student Building. A total of twenty-one courses made use of WRAZL specimens, reaching 877 students in 2019. We are currently organizing our teaching materials to minimize preparation time with the help of our Honors College Intern.

The following list includes classes in which instructors arranged to borrow specimens for specific activities. Most of the specimen loans were used in classes taught within the Student Building including the lab. Occasionally, skeletal specimens are loaned to other departments and units for teaching aids and to assist in research, namely the Department of Earth and Atmospheric Sciences and the Center for Integrated Studies of Animal Behavior. More than 217 specimens were loaned for specific activities. The loaned specimens are integral parts of laboratory exercises in the above courses dealing with comparative animal skeletal anatomy and plasticity, animal behavior, evolution, and domestication, and the use of animal remains in archaeological interpretation. Without the use of the laboratory's comparative collection, these courses could not have provided students with these hands-on learning opportunities and sections that make these courses dynamic and result in higher enrollments.

ANTH X495 Anthropology Independent Study ..... Dr. Laura Scheiber  
ANTH P200 Introduction to Archaeology.....Dr. Susan Alt  
ANTH P380 Prehistoric Diet and Nutrition ..... Dr. Jeanne Sept  
ANTH P399 Buffalo Nation ..... Dr. Laura Scheiber  
ANTH 370 Zooarchaeology (University of Indianapolis).....Sean Coughlin

The following list includes nineteen more classes that regularly use our specimens that are housed in other labs and classrooms in the Student Building. We typically do not consult with the faculty who teach these classes unless they have specific questions.

ANTH A107 Becoming Human: Evolution (x 2)  
ANTH B200 Introduction to Biological Anthropology (x 3)  
ANTH B301 Bioanthropology Lab Methods (x 2)  
ANTH B368 Evolution of Primate Social Behavior  
ANTH B400 Chimpanzee Behavior: Legacy of Jane Goodall  
ANTH B464 Human Paleontology  
ANTH B524 Theory and Method in Human Paleontology  
ANTH B600 Mortuary Practices  
ANTH B602 Paleopathology  
ANTH B400 Chimpanzee Behavior Undergraduate Seminar  
ANTH B600 Chimpanzee Behavior Graduate Seminar  
ANTH P200 Introduction to Archaeology (x 2)  
ANTH P314 Early Prehistory of Africa  
ANTH P330 Historical Archaeology



## ***Research Projects***

During 2019, undergraduate volunteers, graduate researchers, lab affiliates, and WRAZL director Dr. Laura Scheiber participated in numerous ongoing research projects based out of the laboratory. These projects provide volunteers with the opportunity to work with archaeological and comparative faunal material and to participate in project design and implementation. Many of the projects listed below are multi-year or multi-semester and not only expose undergraduates to sustained research but also allow laboratory personnel to involve many more volunteers than would be possible in smaller projects.

### *Ancient Dog Diet Reconstruction*

Throughout much of human history, people have developed close ties with their canine companions. For her dissertation, Anthropology graduate student Amanda Burt is exploring the human-dog connection and ways to explore animal feeding practices in the past. Her research uses microwear textures from the teeth of domestic dogs and their relatives to investigate whether they were fed specific diets, maintained their natural diets, or scavenged for food. Her study sample includes dogs from archaeological contexts in the Midwest and Plains. From 2017 to 2019, her research took her to the Wyoming Archaeological Repository, the Mitchell Prehistoric Indian Village in South Dakota, the Royal Alberta Museum, and the Draper Museum of Natural History in Cody, Wyoming, to collect molds from canid remains recovered from multiple archaeological sites and from wild populations of wolves in the Greater Yellowstone Area. Multiple WRAZL canids provide baseline microwear data for her research. In 2019, she received funding from the Glenn Black Lab to document rock art in northwest Wyoming that feature dogs. This study allowed her to broaden the anthropological scope of her research study. Her co-edited volume, *Beyond Domestication: Archaeological Investigations into the Human-Canine Connection* was submitted in 2019 and will be available in 2020.

### *Animal Pathologies*

The lab has an ongoing project inventorying all skeletal specimens in the collection exhibiting pathologies. In addition to providing researchers at IU with an accurate list of these specimens, the project has also given several students the opportunity to familiarize themselves with the collection as a whole, some of the various pathologies that can affect bones, and how these pathologies may be useful in archaeological and other research. Students enrolled in Della Cook's Paleopathology class (ANTH B602) are allowed to use animal specimens from our collection for their research projects. In 2018, we began entering this data into our database in concert with our inventories to make it searchable by researchers interested in these specimens. We hope to integrate this information into our main database in 2020.

In spring of 2019, ANTH B602 student and WRAZL employee, undergraduate Madison Hinkle, examined two wombat specimens (9010051 and 9010052) from the collection with significant ossification malformities. Both were donated from the Fort Wayne Zoo in 1990. Wombats are a large, muscular marsupial commonly found in mountainous and heathland areas of southeastern Australia. They have an extremely slow metabolism, aiding their survival in arid conditions. When they are kept in captivity, significant pathologies may develop, especially if they are fed inadequate nutrition. Madison investigated the cause for the extreme pathologies on both subjects through collecting landmark data on the long bones and the cranium. She also

worked with veterinary technician Casey Gardner at Avian and Exotic Animal Clinic in Indianapolis to obtain comparative radiographs of both subject's crania and mandibles. She used her collected data, previously documented cases, and the radiographs to determine that poor diet led to dental malocclusion and infection and eventually to abnormal ossification. Madison plans to pursue publication in 2020.

### *Bird Wing Shape Variance*

Geological Sciences graduate student Spencer Hellert explored the evolution of avian flight for her dissertation research. Flight is expensive and, because birds retained the locomotor function of their hind limbs after gaining the ability to fly, the forelimbs are free to possess a locomotor function or not, thus flightlessness is common. Flightlessness has evolved independently in many different avian lineages. Birds provide an intriguing scenario in which all flightless species across the avian phylogeny seem to share similar limb morphologies, especially in the forelimb. Studying the integration of limb elements of volant and flightless birds provides an opportunity to understand morphological constraint in a taxonomic group very different from mammals. Spencer photographed skeletal limb elements of numerous bird specimens at WRAZL to use in geometric-morphometric analyses to quantify and compare trait integration across flightless and flying birds. She completed her dissertation in 2019: *Locomotion Transitions and Sexual Dimorphism: Understanding the Causes of Phenotypic Integration Patterns*.

### *Carnivore Evolution and the Extinction of Creodonts*

Geological Sciences graduate student Anne Kort studies the evolution and extinction of major clades of mammals throughout the Cenozoic driven by environmental changes and competition. She focused on the extinction of creodonts, an enigmatic group of early Cenozoic mammals. At least some were carnivorous and related to Carnivora, the modern group that includes cats and dogs. Their extinction is somehow related to the rise of modern carnivorous mammals, and Anne is using them as a case study for understanding mechanisms of clade turnover. Both creodonts and carnivorans filled the role of terrestrial carnivores, so competitive replacement may have driven creodonts extinct. Alternatively, creodonts may have failed to adapt to changing climate in the Eocene, for which carnivorans were better adapted. For her MS thesis, she focused on the ecology of a mid-Eocene creodont, *Patriofelis ulta*. Her aim was to identify traits that may have prevented it from adapting to changing climate or competing effectively with Carnivora and shed light on the drivers behind the extinction of creodonts at a crucial juncture in the creodont lineage. Anne made use of the lab's comparative collection of otters, badgers, wolverines as part of her research. She completed her master's degree in 2019 with her thesis *The Paleoecology of Patriofelis ulta and Implications for Oxyaenid Extinction*. In the fall she formally started the PhD program. She made extensive use of the Go!SCAN 3D scanner in 2019 for preparation of the next stage of her research, focused on carnivore lumbar vertebrae.

### *Carnivore Locomotion*

This multidisciplinary study was directed by Evolution, Ecology & Behavior graduate student Jesualdo Fuentes-González, using numerous specimens from the William R. Adams Zooarchaeology Laboratory. One of the goals was to collect linear measurement of the hind limbs in species of the order Carnivora and add these to a growing database that includes specimens from all over the country. This research illuminated selective pressures acting on

hindlimbs and forelimbs that differ across Carnivora taxa, such as the effects of social endurance-based hunting on wolf limbs when compared with that experienced by a solitary ambush predator such as a tiger. A comparative analysis of limb proportions in carnivores focused on different evolutionary patterns between forelimbs and hindlimbs, not only involving locomotor types, but also specific ecological and behavioral traits. Jesualdo completed his dissertation in 2018, titled *Phylogenies and the Comparative Method in Morphometrics: A Behavioral Glimpse on Morphological Evolution*. In 2019, he published two articles as the primary author: “Using Phylogenetic Comparative Methods to Gain Insight into the Evolution of Social Complexity” in the *Journal of Behavioral Ecology and Sociobiology* and “A Bayesian Extension of Phylogenetic Generalized Least Squares: Incorporating Uncertainty in the Comparative Study of Trait Relationships and Evolutionary Rates” in the *International Journal of Evolution*.

#### *Feathered Theropod Dinosaur Claws*

Geological Sciences graduate student Silvia Ascri is focusing on deinonychosaurids, or feathered dinosaurs, for her dissertation research. The goal of her study is to analyze the functional morphology of enlarged pedal claws of deinonychosaurids by comparing both their 2D shapes and their 3D shapes with the claws of modern animals of known function. Two-dimensional analyses are conducted using geometric morphometrics, which help determine which modern animal groups deinonychosaurids most resemble in shape. Three-dimensional finite element analyses help determine stress levels that the claws can endure, and likewise determines which animal groups they resemble in terms of withstanding various forces. Silvia is also studying the behavior of a modern analog bird (*Cariama cristata*) in the wild to observe how it uses its enlarged pedal claw. Her work at WRAZL involves 3D scanning of a variety of our bird comparative specimens.

#### *Heart Mountain Cultural Icon Project*

Heart Mountain is an impressive geological anomaly located outside Cody, Wyoming, which is visible across the surrounding basin. Identified on the earliest fur trapper maps, Heart Mountain has served as a recognizable landmark for centuries. The Crow (or Apsaalooké) tell stories of vision questing, buffalo hunting, camping, traveling, and fighting at Heart Mountain, and it was within the boundaries of the Crow Reservation until the Fort Laramie Treaty of 1868. Known as Foretop’s Father or *Ihkapiliish Ilapxe*, it was (and still is) considered to be the adopted father and protector of the Crow people. The mountain still holds special significance to local community members today.

For several years, Dr. Scheiber’s has been conducting research at Heart Mountain, in partnership with the Heart Mountain Nature Conservancy. Archaeological work involved survey of land owned by the Nature Conservancy around the mountain as well as improved documentation of previously surveyed sites. Techniques include digital mapping using both visual and satellite based devices, hand mapping of sites and features, recording of surface artifacts, photogrammetry of stone circles and cairns, and drone flyovers. In 2017, her work was featured in the *Chicago Tribune* (<http://www.chicagotribune.com/suburbs/post-tribune/news/ct-ptb-wyoming-iu-climb-st-0622-20170624-story.html>). In 2019, Dr. Scheiber participated in the 10<sup>th</sup> annual Heart Mountain Pipe Ceremony with members of the Crow Tribe and numerous community members. She gave a presentation about the importance of Crow people in the local tourism economy of the early 20<sup>th</sup> century. She also led a tour of former residential structures at

the base of Heart Mountain for children enrolled in the Cody Science Kids Program, the Heart of the Mountain.

Japanese Americans who were interred at the Heart Mountain Relocation Camp during World War II also connected with the mountain, seen as a sentinel watching over the camp. Indiana University graduate student Cally Steussy is writing her dissertation about the Japanese-Americans experiences at Heart Mountain: *Takamine o Se ni: Using Material Culture to Investigate Attachment to the Wyoming Landscape during the World War II Nikkei Incarceration*. In 2019 the Heart Mountain Internment Center hired her as a Public Intern, allowing her to expand her dissertation research.

#### *In the Shadow of Cedar Mountain: Archaeology at Apple Jack Ranch, Park County, Wyoming*

Cedar Mountain is the smaller of two mountain peaks just west of Cody, Wyoming. Part of the Absaroka Mountain Range, it is one of the most recognizable features in the Bighorn Basin. It is flanked on the north side by the deep Shoshone Canyon at the bottom of which flows the North Fork of the Shoshone River coming from Yellowstone National Park. The Crow called this mountain *Awaxaammaalahkápe*, which translates as Spirit Mountain. It is perhaps best known by the presence of Spirit Mountain Cave, a former U.S. National Landmark located on the northern side of the mountain. With funding from the George C. Frison Institute of Archaeology, Dr. Scheiber led a small archaeological team in summer of 2019 to fully survey and record the Apple Jack archaeological site and surrounding area, located in the foothills of Cedar Mountain. They recorded attribute data for 23 features (including stone circles, hearths, and cairns) and 50 artifacts (including several diagnostic tools dating from the Archaic through the Late Prehistoric). Work in the area will continue in 2020 in collaboration with the Cody Science Kids youth education program.

#### *Indigenous Animal Exploitation and Food Practices on the Central Plains*

The Albert Bell site (14SD305) is a Central Plains tradition hamlet located in western Kansas (A.D. 1000) and the Little River site (14RC410) is a Great Bend aspect site (A.D. 1500) located in Rice County, Kansas. Fauna from these sites are on loan to WRAZL for analysis. Dr. Scheiber's P425 Faunal Osteology course completed bone surface modification analysis on the Albert Bell materials in 2016. This site allowed students first-hand experience working with archaeological material and serves as both teaching material for osteology and archaeology. A new loan of bone tools from the site was formalized in fall of 2016. Undergraduate research assistant Madison Salomon double-checked all of the information in 2017. She determined provenience information, entered data, and photographed key specimens. Madison and Dr. Scheiber coded the rest of the large mammals and continued identifying the smaller mammals. She identified the birds and fish and is working through the other smaller mammals, especially the lagomorphs. A loan from the University of Wyoming archaeological repository of two jack rabbits in 2018 were essential for completing this analysis. The Albert Bell materials will be returned to the Kansas State Historical Society in 2020.

#### *Market Street Chinatown*

The Market Street Chinatown was a nineteenth century Chinese community in San José, California. Much of the site was excavated in the 1980s following urban redevelopment, but most of the artifacts were never analyzed and remained in storage. The Market Street Chinatown Archaeological Project was founded in the early 2000s as a research and education program

developed by the Stanford Archaeology Center, the Stanford University Department of Anthropology, History San Jose, and the Chinese Historical and Cultural Project. The goals were a more comprehensive analysis and community-based involvement. In 2013, Indiana University Anthropology graduate student Ryan Kennedy started analyzing the fauna from this site for his dissertation. With funding from the Wenner-Gren Foundation for Anthropological Research, Ryan brought 13 boxes of archaeological animal remains to the lab. He heavily relied upon the laboratory's comparative skeletal collection, and he trained two students, Samantha Couch and Sara Dunevant, to become specialists in fish osteology. He processed nearly 60 fish species that he personally procured, a representative sample of which were accessioned into the lab's comparative collection. Ryan completed his dissertation during the summer of 2016, *Fan and Tsai: Food, Identity, and Connection in the Market Street Chinatown*. In 2019, Kennedy co-authored several articles relating to animal exploitation and collection management including "Challenges and Opportunities with the Market Street Chinatown Collection, San Jose, California" and "Reclaiming the Research Potential of Archaeological Collections" both in *New Life for Archaeological Collections*.

#### *Mississippian Archaeology, Food, and Animals*

The William R. Adams Zooarchaeology Laboratory was founded in order to build a comparative collection to help analyze faunal materials recovered from prehistoric village contexts, namely Angel Mounds State Historic Site (12VG1) in southern Indiana. Indigenous people of the Middle Mississippian period built and occupied this large earthwork mound complex on the banks of the Ohio River from 1100 to 1450 AD. Although the collection is now used in a wide variety of contexts, providing resources to identify regional archaeological fauna remains is one of its core strengths. Research associates and graduate students investigating several Mississippian sites have visited us in the last several years. For her dissertation, Meghan Buchanan investigated the role of warfare in everyday life at the Common Fields site (23GS100), a single mound site near Ste. Genevieve, Missouri. Although located right along the Mississippi River, animal resource procurement practices focused on non-riverine contexts. Based on this research, Meghan published "Diasporic Longings? Cahokia, Common Field, and Nostalgic Orientations" in the *Journal of Archaeological Method and Theory* in 2019.

Christina Friberg, postdoctoral research fellow in IU's Department of Earth and Atmospheric Sciences, began a collections research project in August 2019, with Dru McGill (North Carolina State University) and Tony Krus (University of South Dakota). The project goals are to test the validity of direct dating methods for ceramic vessels and to determine the chronological significance of seriated trends in jar handle styles from Angel Mounds. Pottery sherds were chosen from feature contexts that also contained organic material that could be cross dated. Both botanical and faunal samples were pulled from the corresponding contexts for evaluation. Faunal samples were brought to the William R. Adams Zooarchaeology Laboratory at IU for analysis. Dr. Scheiber helped identify species and advised on the best samples for AMS dating, identifying elements that potentially belonged to the same individual represented primary deposits within the feature context. The researchers eventually decided to date botanical remains rather than faunal remains, and they are currently awaiting results.

Sidney Travis is an MA student at Ball State University. For her thesis (*Disclosing Dietary Differences: Implications of Social Stratification and Feasting at the Curry Site (22OK578)*), she is studying the Curry Site (22OK578), a small Mississippian single mound site located in Okitebbeh County, Mississippi. Currently, the focus of dietary patterns of

Mississippians lies mainly within large societies, such as Moundville, that held thousands of individuals. Travis' research adds to the literature of small single mound sites that are often ignored or forgotten. By analyzing the faunal assemblage from the mound, she is investigating whether the social gathering area at the site was occupied by commoners, elites, or possibly used as a feasting location. She is examining butchery patterns, bone fragmentation, taxonomic diversity, and the deer element utility index. In November, she visited WRAZL with several colleagues from Ball State and used over 40 specimens from the comparative collection to help identify faunal remains from the Curry Site.

An additional research project associated with Mississippian archaeology, food, and animals is part of the rehousing efforts of the Angel Mounds faunal remains for the Saving America's Treasures Grant, spearheaded by Amanda Burt. Although their work to date has focused on re-boxing and organizing, they hope to have the opportunity to conduct formal analysis in 2020.

#### *Mountain Landscapes of the Greater Yellowstone Ecosystems: Caldwell Creek*

Several archaeological sites in the Caldwell Basin (48FR6917, 48FR7091, 48FR7119, 48FR7120) of Fremont County, Wyoming, were the focus of Dr. Scheiber's Bighorn Archaeology summer field projects from 2013 to 2018. These sites were occupied by mountain hunter-gatherers who produced an incredible array of material culture including a higher quantity of pottery fragments than any other site in the entire state of Wyoming. This analysis was featured in Dr. Scheiber's 2015 co-edited book *Engineering Mountain Landscapes: An Anthropology of Social Investment*, published by the University of Utah Press. Undergraduate volunteers, employees, and graduate students assisted in analyzing and recording artifacts recovered during the summer research. So far, nearly 70,000 chipped stone flakes have been coded. Ongoing laboratory analysis has produced several conference presentations, and analysis is nearing completion. We anticipate more research opportunities for our students interested in archaeological artifact data capture and interpretations. In 2017 an online science news magazine published an article based on the work, "Wyoming Wildfire Reveals 'Massive' Shoshone Camp, Thousands of Artifacts," shared widely through social media. Available data shows a staggering reach, with nearly 100,000 views and 40,000 shares through Facebook, Pinterest, Reddit, and Twitter. Responses to the article were overwhelmingly positive. The Archaeological Conservancy, Archaeological News, and r/Archaeology all shared the story. While this was excellent coverage of the research for public archaeology and outreach, it also had a potential negative impact in our inability to protect the sites from looters. Illegal artifact collection is a huge problem following forest fires. Therefore, in 2017 and 2018, she returned to the area to monitor for potential site disturbance as well as to assess future research potential at near-by sites. Dr. Scheiber is currently working on an article and book manuscript related to this research project.

#### *Multi-Ethnic Interactions at Fort Ouiatenon*

Fort Ouiatenon (12T9) was an eighteenth century French outpost located on the Wabash River near present-day West Lafayette, Indiana. Excavated intermittently since the 1960s, the daily life of domestic multiethnic households surrounding the fort only began to be considered archaeologically following fieldwork in 2013. In coordination with a University of Southern Indiana field school led by Dr. Michael Strezewski, then doctoral candidate Kelsey Noack Myers conducted preliminary dietary faunal analysis on a sample assemblage from one of these

houses immediately outside of the fort. The laboratory's comparative skeletal collection was integral in allowing her to produce data that enriches legacy collections held by the Glenn A. Black Laboratory and the Tippecanoe County Historical Association that were previously excavated at the fort. These analyses speak to the involvement of indigenous Indiana tribes known as the Wea, Kickapoo, and Mascouten in the early history of Indiana prior to the removal period. Kelsey completed her dissertation in the summer of 2017, *Indigenous Landscapes and Legacy Archaeology at Ouiatenon, Indiana*. Her 2019 publication, "Reconstructing Site Provenience at Ouiatenon, Indiana," in *New Life for Archaeological Collections* summarizes this research.

#### *Osteology of Reptiles and Amphibians*

In fall of 2019, we loaned five iguanas to Beth Reinke (Assistant Professor at Northeastern Illinois University) who is creating a reference book *Osteology of Reptiles and Amphibians: A Modern Comparative Guide for Vertebrate Biologists, Paleontologists, and Zooarchaeologists* (Elsevier publisher) that will provide illustrations of reptile and amphibian skeletal features for scientific use. She is using specimens from the William R. Zooarchaeology Laboratory as reference material. The last comprehensive volume of reptile osteology was published in 1925 and was revised in 1956. This is the only assembled resource for paleontologists and zooarchaeologists interested in identifying reptile or amphibian skeletal remains. In the past ten years, there have been multiple publications describing osteological reptile and amphibian specimens for a paleontological audience, but there is no modern assemblage of these studies and no single location for biologists studying existing species to review morphology. Vertebrate biologists and others interested in a visual guide to interspecific variation in morphology also have no available resources. This book will contain a comprehensive guide to identifiable characters of modern reptiles and amphibians, organized by bone and taxonomic group. This maximizes the guide's utility to both modern biologists (e.g., vertebrate physiologists, comparative anatomists) and scientists interested in comparing extant specimens to fossil specimens (e.g., evolutionary biologists, paleontologists, zooarchaeologists).

#### *Osteometric Species Identification of Artiodactyl Stylohyoid Bones*

In 2018, Dr. Patrick Lubinski of Eastern Washington University contacted the William R. Zooarchaeology Laboratory about the possibility of borrowing artiodactyl stylohyoid bones for a research project involving blind testing of results for determining species identification and side based on osteometric data. In early 2019 we sent him 34 hyoids from numerous species for use in the research study to be conducted by Lubinski and R. Lee Lyman of the University of Missouri. Their study was completed in 2019, and their resulting article will be published in *American Antiquity* in 2020.

#### *Padre Nuestro Cavern, Dominican Republic*

Between 2005 and 2010, dive teams from IU's Center for Underwater Science recovered artifacts and extinct animal remains from Padre Nuestro Cavern, a submerged freshwater limestone cavern located in the East National Park in the southeastern peninsula of the Dominican Republic. Dr. Scheiber was part of the research team documenting several extinct ground sloth species at WRAZL starting in 2010. School of Public Health graduate student Jessica Keller prepared a comprehensive inventory of the sloths for her master's thesis in 2012. Anthropology PhD student Jenny Riley wrote a site biography and explored the possibility of

cutmarks from human predation on the sloth bones for her 2017 dissertation *Was Sloth The Ultimate Slow Food? An Archaeological Examination of Padre Nuestro Cavern, Dominican Republic*. In addition to using the laboratory's comparative collection to identify specimens, Jenny also performed taphonomic and butchering experiments to investigate bone surface modification. In 2019, undergraduate Thomas Brimm documented, scanned, and illustrated the sloth bones for his thesis in the Individualized Major Program (IMP) in Underwater Archaeology and certificate in Underwater Resource Management: *Dive into Taíno History – Archaeology of the Caverns of the Dominican Republic*. Thomas completed his IMP project in spring of 2019 and presented his research at the IU Crossroads Conference, winning the best undergraduate poster prize.

### *Painter Cave*

The Painter Cave site (48PA3288) is a dry rockshelter in the foothills of the Absaroka Mountains of northwestern Wyoming that has deeply stratified deposits. Archaeological materials were disturbed several decades ago. Indiana University's Bighorn Archaeology project conducted a pilot study at Painter Cave and the surrounding area in 2014 in an effort to identify and recover any additional cultural deposits. Artifact recovery addressed local landscape use, cultural chronology, subsistence strategies, and environmental conditions. The looter activity unfortunately proved to be extensive. Although team members identified numerous archaeological signatures at different sites in the study area, primary deposits in the shelter itself were disturbed in such a way that investigation into the use of Painter Cave by past peoples was challenging. Hundreds of faunal remains were collected during the investigation that resulted from pack rat activity in the rock shelter. The use of laboratory facilities and our extensive comparative skeletal collection provided opportunities for undergraduate volunteers to gain experience and training in the identification of faunal material. Recovery of faunal remains links ecological histories and fine-tunes environmental climatic fluctuations which contributes to the field school's broader goals of better understanding the Greater Yellowstone Ecosystem. The Painter Cave faunal assemblage is now used for teaching purposes in classes like Faunal Osteology (ANTH P425) and People and Animals (COLL C104). A detailed article by Laura Scheiber and Amanda Burt "Archaeology and Social Geography of Sunlight Basin, Wyoming," was published in 2017. Additional comparisons to other packrat assemblages are planned for 2020.

### *Plantation Archaeology in the Antebellum South*

Ball State University archaeologists have used the William R. Adams Zooarchaeology comparative collection on several occasions to help identify vertebrate faunal remains recovered from plantation sites in the South. This research is led by faculty member S. Homes Hogue and funded by the Chicora Foundation of Columbia, South Carolina. In 2016, Erin Steinwachs and Felicia Konrad used our comparative collection to analyze fauna from the Kendal Plantation (31BW788) in North Carolina, a rice plantation founded in the mid 1700s. Research questions focused on animal domestication and exploitation practices that can assist in identifying differences in subsistence patterns and wealth and status between plantation owners and slaves in the greater Antebellum South. This analysis was published in a 2016 research report. In 2018, Dr. Hogue and graduate students Katie Wasley and Kelli Watham visited the WRAZL comparative collection to identify more than fifty faunal fragments from four sites (38CH1541, 38CH1542, 38CH2242, and 38CH2244) at the Mullet Hall Plantation in South Carolina. Two of



these sites were in use during the 18<sup>th</sup> and 19<sup>th</sup> century, another was associated with 20<sup>th</sup> century workers, and the last site was associated with a 20<sup>th</sup> century naval yard cafeteria. Comparisons of the faunal assemblages recovered from the identified activity areas and associated features at Mullet Hall Plantation lead to important information on differential access to animal food by the plantation inhabitants. Their results were published in a 2018 chapter in *Archaeological Investigations at Mullet Hall Plantation, Johns Island, Charleston County, South Carolina*.

#### *Poverty Point Culture in the Lower Ohio Valley*

Indigenous hunters and gatherers living in Indiana 3,000 years ago left behind stratified shell midden deposits with evidence of the first villages in the Midwest. Archaeological sites from this period show evidence of long-distance connections between these people and those living near the Gulf Coast, referred to as Poverty Point. The Clarksville-Kelly site (12CL1) at the Falls of the Ohio and the Murphy site (12PO1) at the juncture of the Wabash and Ohio Rivers appear to be important northern outposts of Poverty Point interaction based in part on the presence of unusual pottery types for the area. The Clarksville-Kelly site was first explored by geologist Edward Cox in the 1880s. The site is best known as a Late Archaic shell mound, based on minimally reported excavations by E.Y. Guernsey in 1934 for the Indiana Historical Society and by Dr. Donald Janzen in 1969 and 1970, as part of his Late Archaic research in the Falls region. The lab's founder Dick Adams conducted surface surveys at the Murphy site region in the late 1940s and was the first to publish descriptions of some of the unusual pottery there. An interesting artifact recovered from the site includes an engraved magnetite plummet that lab personnel helped Cheryl Munson create a photogrammetry model for presentations, featured on our sketchfab page. The plummet has relief carving depicts a raptor claw that wraps around the sides and bottom of the object. Research is on-going, and we look forward to further collaborations.

#### *Revealing Indiana University's Earliest Cultural Landscapes through Heritage Archaeology*

The Wylie House Museum is the 1835 house of Indiana University's first president, Andrew Wylie, and is the university's oldest property. In 2018 the Glenn A. Black Laboratory (directed by Dr. April Sievert) received a grant from the Office of the IU Bicentennial to excavate at the Wylie house. During a four-week summer field school, students learned archaeological field methods (including remote sensing and GIS based technologies) while searching for two buried garden facilities dating to 1859. In fall of 2019, Amanda Burt utilized the WRAZL comparative collection to analyze animal remains from the Wylie House recovered during excavations. Burt reported the presence of eight species of mostly domesticated animals from 670 identified specimens.

#### *Revolutionary War Provisioning at Fort Morris*

Fort Morris was a Revolutionary War fort on the coast of Georgia and is part of a long-term research project made possible through the use of the laboratory's comparative collection. The project was originally supervised by Ryan Kennedy, and it has provided opportunities for undergraduate volunteers to participate in extensive zooarchaeological analysis and research design. Tamar Brendzel completed the identification of all coastal and marine animal bones as well as most of the fish remains recovered from the site. Ryan and Tamar presented a paper at the Society for American Archaeology Annual Meeting in Vancouver in 2017, "The Fish of Fort Morris: A GIS-based Study of Human-Environment Interaction during the American

Revolutionary War.” In 2016, Amanda Burttt starting analyzing the mammal remains. This project is set to be completed in 2020, and the collection remains on loan to the lab from the Georgia Department of Natural Resources.

### *Rockhouse Hollow*

Rockhouse Hollow (12PE100) is a multi-component site that dates back to at least 7,000 years ago located in the Hoosier National Forest in Perry County, Indiana. The Indiana Department of Natural Resources Division of Historic Preservation and Archaeology named it as their site of the month in August of 2018. An extensive faunal assemblage originated from excavations conducted by Dr. James Keller in 1961. Dr. Heather Latham later analyzed materials from H70, one of the 10' x 10' units excavated by Keller. Recent archaeological work at the site initiated by Ed Herrmann instigated further analysis of the faunal assemblage. The Rockhouse Hollow faunal project of 2014 was a collaborative project between Angela Doyle, the Hoosier National Forest Archaeologist; Edward Herrmann, then research scientist in the IU Department of Earth and Atmospheric Sciences; and Matthew J. Rowe, then research associate with the William R. Adams Zooarchaeology Laboratory. The analysis was completed by undergraduate students in 2016, and the bones were returned to the Glenn A. Black Laboratory of Archaeology. In 2019 we approved a new loan of faunal materials from Rockhouse Hollow to the lab. Amanda Burttt will be conducting further analysis, specifically identifying taxa belonging to eagles and carnivores that may have additional significance for indigenous communities today.

### *Trout Creek Archaeological Survey*

The Trout Creek Archaeological Survey took place in the Wapiti District of the Shoshone National Forest in 2010 and 2011, by Bighorn Archaeology research teams led by Dr. Laura L. Scheiber. The survey was located on the eastern edge of the area affected by the 2008 Gunbarrel forest fire. The purpose of the survey was to identify and record cultural resources and to assess damage from fire, erosion, and artifact collection along the Trout Creek Trail. Nearly 1,800 acres were surveyed, with 18 new sites and 22 new isolates recorded during 14 total field days. Research teams identified several large multi-component campsites of various ages. The earliest artifact dates to at least 8,500 years ago during the Paleoindian Period. Recent artifacts date to after the founding of the Yellowstone Park Timberland Reserve of 1891. The majority of the sites are Late Prehistoric campsites on flat terraces and riparian zones around Trout Creek and its tributaries. More than half of the sites and isolated contained artifacts that are diagnostic of late pre-contact and contact era Mountain Shoshone people, who occupied the area after A.D. 1500. Many of the sites and isolates may be part of a larger Trout Creek site and landscape complex.

In 2019, the Wyoming State Historic Preservation Office implemented a new, online system, WyoTrack, where all future site assessment and survey documents will be uploaded. Use of this new system required brief training and familiarization in order to navigate the site and upload relevant information. The previously generated site forms then needed to be transcribed, modernized, and uploaded to the WyoTrack system. Dr. Scheiber and Thomas Brimm additionally completed all of the isolated resource forms for the survey and uploaded them to the system. A comprehensive report was composed, detailing the survey's scope and results, and sent to the managing agency for comment. This report will be submitted in full to the Wyoming State Historic Preservation Office in 2020.

### *Turtle Shell Curvature Correlates with Environmental Conditions*

To evolutionary biologists, reptiles and amphibians are an especially interesting group of animals. They include the first tetrapods to colonize land, they are uniquely adapted to survive in most climates despite being ectothermic and often requiring specialized diets, and they represent an array of anatomies and body shapes that are identifiable from skeletal features (e.g., turtle shells, clawed limbs, horns). Beth Reinke is currently using geometric morphometric methods to study how correlations between turtle shell curvature and the environment, using specimens from the William R. Adams Zooarchaeology Laboratory as reference material.

### *Uncovering the Hidden History of Indiana University's Ground Sloth*

Indiana and surrounding areas used to be inhabited by numerous animals that went extinct at the end of the Ice Age, including several species of giant ground sloths. The largest of these was *Megalonyx jeffersonii*, of which a complete skeleton was on display at Indiana University at the turn of the century (<https://igws.indiana.edu/megajeff/>). A fire destroyed much of the other items, but the sloth survived. At some point later the Geology Department tossed it from a second story window to a dump truck below, along with many other priceless specimens. Five bones were scavenged, which recently were located at the Indiana State Museum in Indianapolis. Their records indicate that they were donated by William Adams, although we cannot yet find any records that they were ever accessioned into the IU Zooarchaeology Laboratory. With funding from the IU Bicentennial Project, our colleagues at the Indiana Geological & Water Survey scanned the remaining bones along with bones from other *Megalonyx* specimens. Combining these, they created a 3D model of the skeleton that was discarded some years ago. They then recreated the skeleton through an elaborate process of laser cutting cardboard and assembling the pieces like that of a giant puzzle. The recreated *Megalonyx jeffersonii* skeleton, nicknamed 'Megajeff,' will be on display in Franklin Hall in 2020 and will tour the state on a museum bus, teaching visitors about Indiana's Pleistocene megafauna and of the importance of proper collections stewardship. Researchers Polly Sturgeon and Gary Motz presented two papers about this project in 2019, "Don't Throw Your Specimens Out of a Window: Resurrecting IU's Lost *Megalonyx jeffersonii*," at the Society for the Preservation of Natural History Collections Annual Meeting, and "Curating Authentic Experiences with Digital Objects Using Esri Story Maps" at the Geological Society of America Annual Meeting.

### ***Dick Adams Legacy***

William R. "Dick" Adams founded the IU Zooarchaeology Laboratory in 1945 while working as an archaeologist for Glenn Black at the Angel Mounds archaeological site outside Evansville, Indiana. He wanted to build a comparative database of faunal specimens to help identify animal bones that were found during excavations at this important window to the past. He led the lab from a makeshift shed in the field to the basement of his house to several locations at Indiana University. When he passed away in September of 2003, he had built the collection to over 10,000 specimens. He was 80 years old, and although he had officially retired the year before, he still came into to work most days. Dr. Scheiber is only the second director in over 70 years. She was fortunate to overlap with Dick for a year but was unable to anticipate which questions to ask him about the lab and its collections. In 2017, she found two incredibly useful resources: an article from the *Proceeds of the Indiana Academy of Science* published in 1988 by Dick Adams and Janis Kearney called "Zooarchaeology at IU: The Past, the Present, and the

Future” and a 30-page typed transcript from an interview with Dick in 1996. The interview was conducted by Peter Kraemer for the Oral History Research Center as part of an oral history project called the “Indiana University Oral History Archive.” These materials are incredibly helpful for understanding the history of the lab and the collection. In 2020, we hope to obtain a copy of the audio file from the original cassette, which is currently being digitized through the IU Media Digitization and Preservation Initiative (MDPI) project. We honored Dick’s contributions in 2018 by re-designing one of our display cases to highlight his work at Angel Mounds. This display will remain installed into 2020. In July of 2019, Dick’s granddaughter Hannah Cain arranged a tour of the lab for the residents of Redbud Hills Retirement Community.

### ***Section C: COMPLIANCE***

#### ***Safety Training and Compliance***

We report that the laboratory is in compliance with Indiana University Biosafety Committee guidelines for the proper storage of animal specimens in our freezer and that the 2011 repairs to the freezer compressor and other critical components are still (mostly) functioning properly. The freezer is monitored by IU Physical Plant, who receive a notification when the temperature falls outside of normal range. The laboratory passed both Office of Environmental, Health, and Safety and Institutional Biosafety Committee and Environmental Health and Safety Continuing Review inspections in 2019.

As part of our continued commitment to laboratory safety, all laboratory volunteers receive a mandatory laboratory safety orientation. The orientation introduces students to safety equipment and its location throughout the laboratory as well as proper procedures for evacuating the laboratory and responding to emergencies. We additionally restrict access to the lab to times when our staff and advanced students are available. In addition to the mandatory safety orientation, we also hold optional supervised specimen preparation workshops during which students are introduced to the risks associated with preparing skeletal material for the comparative collection and techniques to mitigate that risk. During the specimen preparation workshops we continue to utilize personal protective gear, such as aprons and face-shields, and work surfaces funded through a 2010 Indiana University Department of Anthropology teaching grant.

In 2019, lab personnel reviewed and updated emergency protocols and procedures involving our freezer that houses biologically hazardous material, as we do occasionally have malfunctions. We also updated the laboratory safety manual and administrative guidelines, inventoried our chemical stock, and compiled a material safety data sheet (MSDS) for each of our chemicals that lists information relating to occupational safety and health.

#### ***2019 Inspections and Permits***

##### ***Inspections***

- 08/02/2018: U.S.D.A. Animal and Plant Health Inspection Service (every four years).
- 10/22/2019: Institutional Biosafety Committee (IBC) and Environmental Health and Safety Continuing Review.

### *Permits*

- Bureau of Land Management, Archaeological Resource Protection Act (ARPA) Permit 738-WY-SR18, expired 12/31/2018, renewal in progress.
- Indiana Department of Fish and Wildlife Special Purpose Salvage Permit 20-105, expires 12/31/2020.
- Indiana University Institutional Biosafety Committee (IBC) Protocol 15-033 2019 Annual Continuing Review, expires 01/21/2021.
- Montana Fish, Wildlife, and Parks Scientific Collector's Permit 2020-048-W, expires 12/31/2020.
- U.S. Fish and Wildlife Service, Federal Migratory Bird Special Purpose Salvage Permit MB62702C-0, expires 03/31/2023.
- U.S. Fish and Wildlife Service, Migratory Bird Loan Permit MB168035-0, no expiration.
- U.S.D.A. Forest Service, Archaeological Resource Protection Act (ARPA) Permit WAP415, expired 2/1/2019, renewal in progress.
- U.S.D.A. Soil Science Permit P330-18-00240 to Dr. Stacie King, expires 08/02/2021.
- Wyoming Game and Fish Department Scientific Research Permit 33-664, expires 12/31/2020.
- Wyoming Office of State Lands and Investments, Authorization to Conduct Archaeological Investigation on State Lands, expires 6/26/2022.

## ***Section D: PERSONNEL AND LOAN DETAILS***

### ***Volunteer and Employee Overview***

Much of the 2019 volunteer and employee effort focused on continuing the curation project originally funded by our NSF Biological Research Collection Improvement grant. After the photographic digitization project was completed for mammalian, avian, crocodylian, and turtle specimens, volunteers entered data from photographed documents into Google Form databases to create a list of specimens searchable by element. They also continued the fish rehousing project, and consolidating the songbird collection. Staff members oversaw volunteer activities, and additionally worked on troubleshooting problematic specimens, aided classes making use of the lab, and coordinated volunteer projects. Several volunteers from previous years additionally returned to the lab in 2019.

Courses such as Dr. Scheiber's People and Animals course (scheduled for fall of 2020) and Buffalo Nation (taught in the spring of 2019) greatly increase the profile of and interest in the laboratory among undergraduate students. Additionally, participants in her Bighorn Archaeology summer field schools also often volunteer in the lab. Samantha Couch also actively recruits students from the WonderLab internship program. Email announcements sent through Anthropology, Biology, and Animal Behavior undergraduate listservs further widen our reach of potential volunteers.

Additional activities in the laboratory are related to a variety of research projects including studying evolutionary ecology, vertebrate morphology and paleontology, bone surface modification and taphonomy, and research on fauna from a variety of archaeological sites in Kansas, Georgia, Indiana, Wyoming, and the Dominican Republic. These collections provide undergraduate volunteers with opportunities to work with archaeological faunal collections

beginning with the sorting and organization of specimens to the identification and analysis of data. We also are continuing an ongoing process of adding specimens to the collection, which gives volunteers the opportunity to process animals and prepare them for long-term curation. We ask all of our volunteers to dedicate at least one hour every session to data entry.

*Commitment to Diversity*

The William R. Adams Zooarchaeology Laboratory maintains a safe and welcoming environment to all students regardless of age, color, disability, ethnicity, sex, gender identity, gender expression, genetic information, marital status, national origin, race, religion, sexual orientation, or veteran status. The lab reaches out to the undergraduate community to recruit volunteers and hopes to attract hardworking students including those that feel underrepresented and those the university identifies as underrepresented. Our staff and volunteers are committed to creating and maintaining a respectful environment of tolerance and inclusivity.

*Volunteer and Employee Hours and Brief Bio*

The following is a brief overview of the activities and hours contributed by employees, students, and lab affiliates who regularly volunteered in the laboratory. Each student witnesses a unique working laboratory in which they see a wide variety of activities related to archaeological, zooarchaeological, and natural history research. The hours listed should be considered a minimum amount of hours that each volunteer contributed because they are taken from our volunteer sign-in sheet. We estimate a total of 4,313 hours of combined volunteer and employee time in 2019.

<b>Name</b>	<b>Spring</b>	<b>Summer</b>	<b>Fall</b>	<b>Total</b>
Jorge Luis Rios Allier	0	0	5	5

**Jorge Luis Rios Allier** is a PhD student in Anthropology from Oaxaca City, Oaxaca, Mexico. He is pursuing his Ph.D. in the Archeology and Social Context program. His doctoral research project investigates cultural heritage management in Oaxaca. The Mexican case is an excellent example to illustrate the transition from stewardship-deficit practice towards a cultural governance strategy where local self-government systems try to use development projects related to archaeology as a common pool resource. Jorge was a volunteer at the 2019 Plains Anthropological Conference.

Silvia Ascari	25.5	0	25	50.5
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**Silvia Ascari** is a PhD graduate student in Geological Sciences from Covosna, Romania. Before coming to IU, she studied Earth Sciences at the University of Minnesota. She is one of David Polly’s graduate students, studying vertebrate paleontology. Her research focuses on the functional morphology of dinosaurian claws, especially of the dromaeosaurs. She uses a combination of comparative shape analysis with living birds and mammals, finite element functional experimentation, and field observations on the closest living analogues to test hypotheses about the function of the unusual morphology found in this extinct clade. She spent many hours in the lab in 2019 using the 3D scanner to create models of bird claws from our collection.

Thomas N.Z. Brimm	110	0	240	350
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**Thomas N.Z. Brimm** graduated in 2019 with degrees in Anthropology and Underwater Archaeology as well as a certificate in Underwater Resource Management. He enrolled in 2016’s Bighorn Archaeology field school for which he received the Mary Suzanne Savage Field Research Scholarship. He has conducted further field work in the Dominican Republic and the Thunder Bay National Marine Sanctuary in Lake Huron. He is interested in faunal osteology, archeology, digital modeling, and the human use and exploitation of animals in pre-contact societies. He enrolled in several of Dr. Scheiber’s classes and he often contributes his keen artistic skills to draw and diagram skeletons and artifacts. In 2018-2019, he spearheaded efforts to digitize the WRAZL accession catalogs. He was one of Dr. Scheiber’s advisees in the Individualized Major Program, in which he created 3D models of sloth bones from Padre Nuestro. Thomas presented his thesis at Crossroads Conference in Bloomington in April of 2019, where he received the best undergraduate presentation award. He currently works for WRAZL assisting with various projects such as 3D scanning and photogrammetry as well as contributing to archaeological reports for Bighorn Archaeology.

Amanda Burttt	200	0	200	400
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**Amanda Burttt** is an Anthropology PhD candidate from North Carolina and an advisee of Dr. Scheiber’s. She was our WRAZL laboratory manager from 2015 to 2017. She was integral in setting curation goals of the lab and oversaw a very successful volunteer program. She is currently a research fellow with the Glenn A. Black Laboratory of Archaeology writing her dissertation on human-dog connections in the past. She is also a graduate researcher in the Dietary Reconstruction and Ecological Assessments of Mammals Laboratory at Vanderbilt University, Nashville, Tennessee. She continues as our laboratory mentor for the Pre-College Research Experience Program. She designed and helped to install two current exhibits: the hall exhibit “Finding and Identifying Animals from Angel Mounds” in the Student Building and “Domestic Dog Diets at Angel,” at the Glenn Black Lab. In 2019, she conducted numerous research projects involving the lab, including the Wylie House faunal analysis, Angel Mounds NAGPRA re-housing project, and Rockhouse Hollow faunal inventory. She has also been instrumental in leading the Angel Mounds rehousing team as part of the “Saving America’s Treasures” project at the Glenn Black Lab. She was the co-organizer of the Plains Anthropological Conference, where she also organized a symposium about the Angel Mounds project.

Jack Carter	0	0	7.5	7.5
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**Jack Carter** is a sophomore majoring in Animal Behavior, with interests in scientific journalism, natural history, and activism. He enrolled in People and Animals (COLL C104) in the fall of 2018, in which he shared his passion for issues of animal sentience and human-animal sustainability. He joined us a volunteer rehousing and consolidating our fish and birds.

Margot Corral	50	0	0	50
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**Margot Corral** graduated from IU in 2019 with a degree in Environmental and Sustainability Studies. Originally from Fort Wayne, Indiana, Margot is passionate about social justice, animal rights, and community awareness. In the spring, she enrolled in Dr. Scheiber’s Buffalo Nation class, which met every week in the lab. As a class member, she assisted with the primary mission of the lab, including curation, inventories, assessments, and processing.

















Mal Strubing 50 0 0 50

**Mal Strubing** is a junior from Fort Wayne, Indiana, majoring in History with a minor in Native American and Indigenous Studies. They are committed to exploring issues of social justice and racial equity. Mal's father is a member of the Blackfeet Nation of Montana. In 2019 they worked for the Monroe Country History Center as an Exhibits Assistant, and they currently work at the Indiana University Archives. In the spring of 2019, Mal enrolled in Dr. Scheiber's Buffalo Nation class, which met every week in the lab. As a class member, they assisted with the primary mission of the lab, including curation, inventories, assessments, and processing.

Jordan Tarantino 50 20 0 70

**Jordan Tarantino** graduated from IU with a BFA in Graphic Design in 2014, originally coming from Lawrence, Indiana. In 2019, he worked part-time in the graphic design and marketing department at the Kelley Business school and part time as a research assistant at WRAZL. With his band, "The Cowboys," he plays shows across the eastern United States. Jordan started working for Dr. Scheiber in 2018 to take over the illustrating mission for the archaeological project. He digitized features, stone circles, and excavated units, using Adobe Illustrator, as well as designing promotional materials. In summer 2019, he moved to Ohio where he continues to assist with mapping projects remotely as they occur.

Thierry Veyrié 0 0 5 5

**Thierry Veyrié** received his Master degree in Ethnology and Social Anthropology at the École des Hautes Études en Science Sociales (EHESS) in Paris. Trained in both American and French anthropology, he is dedicated to the interdisciplinary study of Native American cultures. He is currently a PhD candidate in the Anthropology Department, studying Northern Paiute culture, language, and ethnohistory. He was a volunteer at the 2019 Plains Anthropological Conference. In spring of 2020 he will serve as the Anthropology Collections Manager, working with Dr. Scheiber.

Elizabeth Watts Malouchos

**Elizabeth Watts Malouchos** is a PhD candidate in Indiana University's Anthropology program. She received her B.A. from University of Illinois Urbana-Champaign. She studies Mississippian archaeology in Southwest Indiana. Her dissertation examines the Stephan-Steinkamp site in Posey County and discusses what changes in household and community organization may reveal about regional consolidation, relationships with the civic-ceremonial center at Angel Mounds, and connections to the wider Mississippian world. She currently is a Research Scientist at the Glenn A. Black Laboratory of Archaeology. Liz volunteered at the Plains Anthropological Conference, collating and printing all of the on-site name badges for walk-in attendees.

Caris Young 27 0 6 33

**Caris Young** is a sophomore from Greenfield, Indiana, who primarily assisted us in the lab in the spring semester of 2019. She rehoused fish specimens, entered data, and re-organized the collection.

### *WRAZL Alumns*

The individuals listed below are former students who spent a considerable amount of time in the William R. Zooarchaeology Laboratory while enrolled at Indiana University, as volunteers, interns, and researchers. Their contributions continue to be essential components to our successful missions in curation, outreach, and research.

#### **Meghan Buchanan** (PhD 2015)

BA, Anthropology, University of Illinois, 2003; MA, Anthropology, Southern Illinois University Carbondale; PhD, Anthropology, Indiana University, 2015.

Dissertation title: *Warfare and the Materialization of Daily Life at the Mississippian Common Field Site.*

Research interests: zooarchaeology, materiality, Mississippian archaeology, warfare.

Current position: Assistant Professor, Department of Sociology, Anthropology, and Social Work, Auburn University.

#### **Katherine L. Burnett** (PhD 2013)

BA, Anthropology, University of Delaware, 2007; MA, Anthropology, Indiana University, 2011; PhD, Anthropology, Indiana University, 2013.

Research interests: historic archaeology, Swedish-American archaeology, farmsteads, invertebrates, narrative.

Current position: Senior Associate Scientist II (Archaeologist) at Environmental Consulting & Technology, Inc. (ECT), Ann Arbor, Michigan.

#### **Charles P. Egeland** (PhD 2007)

BA, Anthropology, Colorado State University, 2001; MA, Anthropology, Indiana University, 2005; PhD, Anthropology, Indiana University, 2007.

Dissertation title: *Zooarchaeological and Taphonomic Perspectives on Hominid-Carnivore Interactions at Olduvai Gorge, Tanzania*

Research interests: Plio-Pleistocene, biological anthropology, taphonomy, hominid evolution, prehistoric butchering, zooarchaeology

Current position: Assistant Professor, Department of Anthropology, University of North Carolina-Greensboro.

#### **Jesualdo Fuentes-González** (PhD 2018)

BS, Biology, University of Antioquia, Medellín, 2007; MSc, Biology, National University of Colombia, Bogotá D.C., 2011; MSc, Applied Statistics: Indiana University, Bloomington, 2016; PhD, Evolution, Ecology & Behavior, Indiana University, 2018.

Dissertation title: *Phylogenies and the Comparative Method in Morphometrics: A Behavioral Glimpse on Morphological Evolution.*

Research interests: macroevolutionary patterns, phylogenetic comparative methods, morphometrics, carnivore limb coevolution.

Current position: Postdoctoral Researcher, Department of Biological Sciences, University of Alabama.



**Samuel I. Haskell** (MS 2018)

BA, Anthropology and Underwater Archaeology, Minor in History, Certificate in Underwater Resource Management, Indiana University, 2015; MS, Recreation, School of Public Health, Indiana University, 2018.

Research interests: underwater resource management, shipwreck archaeology, photogrammetry, living museums of the sea.

Current position: Assistant Director, Center for Underwater Science and Diving Safety Officer, Office of Environmental Health and Safety, Indiana University.

**Spencer Hellert** (PhD 2019)

BS, Geology and Biology, Augustana College, 2012; MS, Ecology, Evolution, and Conservation Biology, University of Illinois Urbana-Champaign, 2014; PhD Geological Sciences, Indiana University, 2019.

Dissertation title: *Locomotion Transitions and Sexual Dimorphism: Understanding the Causes of Phenotypic Integration Patterns*

Research interests: evolutionary developmental biology, modularity and integration, sexual dimorphism, locomotion evolution

Current position: Postdoctoral Fellow, Field Museum of Chicago

**Blaire Hensley-Marschand** (PhD 2017)

BA, Anthropology, Indiana University, 2006; MA, Anthropology, Indiana University, 2013; PhD, Anthropology and Geological Sciences, Indiana University, 2017.

Dissertation title: *Homo erectus in China: Paleoclimate, Paleoenvironment, and Subsistence near their Northeastern Range Limit.*

Research interests: carnivorous feeding behavior of early Homo, hominid origins, zooarchaeology, taphonomy, Olduvai Gorge, *Homo erectus* in China.

Current position: Adjunct Faculty, University of Southern Connecticut.

**Jacob Heredos** (BA 2015)

BA, Anthropology, Linguistics, and International Studies, Indiana University, 2015.

Undergrad summary: lab research assistant 2014-2018, participant in 2014 Bighorn Archaeology field school, digital illustrator, archaeological analysis, linguistics fieldwork in Oaxaca, Mexico.

Current position: applying for graduate schools to study computational linguistics.

**J. Ryan Kennedy** (PhD 2016)

BA, Archaeology, University of Virginia, 2004; MA, Historical Archaeology, University of Massachusetts, Boston, 2008; PhD, Anthropology, Indiana University, 2016.

Dissertation title: *Fan and Tsai: Food, Identity, and Connection in the Market Street Chinatown.*

Research interests: zooarchaeology, Chinese diaspora, historic fisheries, historic archaeology, human-animal interactions, archaeology of food, food and identity, commodification of animals.

Current position: Co-PI, Stanford Cangdong Village Project; Research Associate, Department of Anthropology and Sociology, University of New Orleans.

**Michelle Lawing** (PhD 2012)

BS, Biology, University of Texas, Arlington; MS, Biology, University of Texas, Arlington; PhD, Geological Sciences and Evolution, Ecology & Behavior, Indiana University, 2012

Dissertation title: *The Geographic and Morphologic Response of Species and Communities to their Climate and Environment.*

Research interests: species distribution models, geometric morphometric methods, phylogenetic comparative methods, niche evolution models.

Current position: Assistant Professor of Spatial Sciences, Department of Ecosystem Science and Management, Texas A&M University.

**Peyton Lindley (BA, BS 2018)**

BA, Anthropology and BS, Criminal Justice, Indiana University, 2018.

Undergrad summary: lab research assistant 2016-2018, participant in 2017 Bighorn Archaeology field school, received Mary Suzanne Savage Field Research Scholarship, undergraduate teaching assistant for People and Animals.

Current position: Recruitment and Marketing Coordinator, AmeriCorps VISTA at Ascend Indiana, Indianapolis; applying to law school.

**April McKay (BS, 2017)**

BS, Environmental Science (Ecology focus), School of Public and Environmental Affairs, Indiana University, 2017.

Undergrad summary: lab research assistant 2014-2018, enrolled in 2016 Faunal Osteology class and 2017 independent study, created guides for bat skeletons and inventoried bat specimens, bat researcher at Yellowwood State Forest, intern for environmental conservation firms, leader in IU Caving Club, volunteer for WildCare of Bloomington, Norway dual citizen, interested in speleology, chiropterology, ornithology, and dog training,

Current position: enrolled in MA program in Ecology and Natural Resource Management, Norwegian University of Life Sciences, Drøbak.

**Rebecca Nathan Mussetter (PhD, 2018)**

BS, Anthropology and History, Carnegie Mellon University, 2006; MA, Anthropology, Indiana University, 2013; PhD, Anthropology, Indiana University, 2018.

Dissertation title: *The Grapevine Creek Buffalo Jump Complex: Interdisciplinary Research on The Crow Reservation, Montana.*

Research interests: Plains Indian ethnohistory, indigenous archaeology, predictive modeling, GIS, buffalo jumps, Crow archaeology.

Current position: Director, Data Analytics, Bighorn Valley Health Center, Hardin, Montana.

**Kelsey Noack Myers (PhD, 2017)**

BA, Anthropology, Southern Illinois University Carbondale, 2005; MA, Historical Archaeology, The College of William & Mary, 2008; PhD, Anthropology, Indiana University, 2017.

Dissertation title: *Indigenous Landscapes and Legacy Archaeology at Ouatatonon, Indiana.*

Research interests: zooarchaeology, legacy collections, GIS, Digital Index of North American Archaeology (DINAA), tribal consultation.

Current position: Lab Director & Principal Investigator, LG2 Environmental Solutions, Jacksonville, Florida.

**Beth Reinke (PhD, 2017)**

BS, Biology, Indiana University, 2012; PhD, Evolutionary Ecology, Dartmouth, 2017.

Dissertation title: *Signaling and Antioxidant Roles of Integumentary Pigments in Vertebrates*.  
Research interests: evolutionary ecology, visual signaling, pigment physiology, evolution of color diversity, herpetology.  
Current position: Assistant Professor, Department of Biology, Northeastern Illinois University.

**Jenny Riley (PhD, 2017)**

BA, Anthropology, University of Florida, 2004; MA, Anthropology, Indiana University; 2010; PhD, Anthropology, Indiana University, 2017.

Dissertation title: *Was Sloth the Ultimate Slow Food? An Archaeological Examination of Padre Nuestro Cavern, Dominican Republic*.

Research interests: Caribbean prehistory, Sloth biogeography, taphonomy, zooarchaeology, bone surface modification, experimental archaeology, public archaeology, animal pathology.

Current position: Adjunct Faculty, Ivy Tech College.

**Matthew Rowe (PhD, 2014)**

BA, Anthropology, University of Southern Maine, 2007; PhD, Anthropology, Indiana University, 2014.

Dissertation title: *Late Paleoindian Rockshelter Use Through Changing Environmental Conditions in the Bighorn Basin, Wyoming: Integrated Perspectives from Zooarchaeology and Geoarchaeology*.

Research interests: zooarchaeology, Paleoindian archaeology, ancestral Hopi archaeology, tribal heritage.

Current position: Assistant Professor, Anthropology Department, University of Arizona.

**Ryann Seifers (BA 2016)**

BA, Anthropology, Indiana University, 2016; MA, Anthropology, University of Wyoming, expected 2020.

Thesis title: *Intersections of Identity, Health, and Diet in the Wyoming Territory: A Bioarchaeological Analysis*.

Research interests: bioarchaeology, paleopathology, zooarchaeology, human health, diet and development.

Current position: Teaching Assistant for Biological Anthropology, University of Wyoming; completing MA program.

**Madison Salomon (BA, 2017)**

BA, Anthropology (minor in Human Sexuality), Indiana University, 2017.

Undergrad summary: lab research assistant 2016-2018, enrolled in 2016 Faunal Osteology, 2017 Laboratory Methods, 2018 Independent Study, participant in 2017 Bighorn Archaeology field school, received Mary Suzanne Savage Field Research Scholarship, received Hutton Honors College Pre-Professional Internship, teaching assistant for 2017 People and Animals, analyzed artifacts from Caldwell Creek, inventoried faunal materials from Albert Bell, coordinated lab's social media outreach.

Current position: Ethnology Collection Technician, Bernice Pauahi Bishop Museum, Honolulu, Hawaii.

**Megan Vladoiu** (BA, 2018)

BA, Anthropology, Indiana University, 2018.

Undergrad summary: lab research assistant 2016-2018, awarded 2017 WRAZL Broken Bone award for most hours in the lab, awarded 2017 Hutton Honors College Pre-Professional Internship Grant.

Current position: Assistant Teacher, Gan Shalom Preschool, Bloomington, Indiana.

### ***2019 Loans to the William R. Adams Zooarchaeological Laboratory***

- Bureau of Land Management, artifact from Oregon Basin petroglyphs, Wyoming.
- Georgia Department of Natural Resources, Fort Morris State Historical Site, faunal assemblage from Fort Morris. Loan OL.2010.003 (SB).
- Glenn A. Black Laboratory of Archaeology, faunal assemblage from the Wylie House, Loan OL2019-01.
- Hoosier National Forest, faunal remains from Rockhouse Hollow. GBL Accession No. 1527 Hoosier National Forest Federal Collection of 30 artifact boxes from the Rockhouse Hollow site in Perry County, Indiana (1, 4, 5, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 36, and 1 box of potential AFO's).
- Kansas State Historical Society, faunal assemblages from the Albert Bell and Little River archaeological sites. Loans 2003-10 and 2016-35.
- Michael and Kathleen Gear, artifact assemblage from Red Canyon archaeological site, Wyoming.
- State of Wyoming, artifact assemblages from Apple Jack site, Wyoming.
- USFS Shoshone Forest, artifact assemblages from numerous archaeological sites in Wyoming.
- University of Wyoming Archaeological Repository, two adult jack rabbit specimens, 8307B and 9411B.

### ***Bechtel Mastodon Loan***

Remains of extinct Ice Age Pleistocene megafauna have been found throughout Indiana. Tish Bechtel Stump of Syracuse, Indiana, contacted the lab in 2015 about loaning us mastodon bones found on her family farm near Goshen, Indiana, in the 1950s. The farm was owned by four siblings, including two dentists and a local teacher. Dick Adams consulted with the family about preservation after they were originally found, and at least some of the bones hung in Dr. Kermit Bechtel's dentist office for years. Kermit's daughter is Tish Stump. Tish and her husband John brought the bones to the lab to discuss their current condition and decided to leave the mandible, humerus, and thoracic vertebrae with us on loan at the time. Throughout 2018, the mastodon bones featured prominently in the hall display outside the lab, where they were accessible for viewing to all students taking classes in the Student Building, and they attracted interest and curiosity from passers-by. They were moved back inside the lab when we changed the display in 2019. Tish and John brought six of their grandchildren to the lab to show them the mastodon in July of 2019. They brought us a carpal from the same individual to add to the loan.

**2019 WRAZL Specimen Loans for Education**

<b>CAT#</b>	<b>COMMON NAME</b>	<b>ELEMENT(S)</b>	<b>PURPOSE</b>	<b>DATE LOANED</b>	<b>LOANED TO</b>
0140263	Hawksbill Sea Turtle	Scutes	Display Case	12/5/2018	Laura Scheiber
0210096	White Rhinoceros	Shull and Horns	Display Case	12/5/2018	Laura Scheiber
1630029	Pacific Cod	Frontal, vertebrae, premaxilla	Display Case	12/5/2018	Laura Scheiber
9210671	Sea Otter	Cranium, scapula, cervical	Display Case	12/5/2018	Laura Scheiber
9220428	Tufted Puffin	Skull, axial skeleton	Display Case	12/5/2018	Laura Scheiber
9220577	Harlequin Duck	Skull	Display Case	12/5/2018	Laura Scheiber
9310499	African Lion	Skull	Display Case	12/5/2018	Laura Scheiber
9370013	Spiny Lobster	Cephalothorax	Display Case	12/5/2018	Laura Scheiber
9370901	Spiny Lobster	Cephalothorax	Display Case	12/5/2018	Laura Scheiber
9610114	Guinea Pig	Skull	Display Case	12/5/2018	Laura Scheiber
9730443	Copperband Butterflyfish	Cranium	Display Case	12/5/2018	Laura Scheiber
A18	Dog	Skull, femur	Display Case	12/5/2018	Laura Scheiber
G152	Chinook Salmon	Dentary, opercle, vertebrae	Display Case	12/5/2018	Laura Scheiber
J28	Polar Bear	Skull	Display Case	12/5/2018	Laura Scheiber
NONE	Coral		Display Case	12/5/2018	Laura Scheiber
NONE	Cattle	Sawed long bone	Display Case	12/5/2018	Laura Scheiber
R30	Dog, Husky	Skull	Display Case	12/5/2018	Laura Scheiber
R38	Dog, Husky	Skull	Display Case	12/5/2018	Laura Scheiber
0010265	Raccoon	Humerus, femur	ANTH P200	2/15/2019	Susan Alt
9610170	Raccoon	Mandible	ANTH P200	2/15/2019	Susan Alt
9610171	Raccoon	Mandible	ANTH P200	2/15/2019	Susan Alt
9910092	Wolf	Femur - L	ANTH P200	2/15/2019	Susan Alt
BB30	Raccoon	Atlas, innominate (1)	ANTH P200	2/15/2019	Susan Alt
BUFFALO NICKEL	Bison	Femur - R	ANTH P200	2/15/2019	Susan Alt

BUFFALO NICKEL	Bison	Humerus - L	ANTH P200	2/15/2019	Susan Alt
BUFFALO NICKEL	Bison	Femur - L	ANTH P200	2/15/2019	Susan Alt
BURNING			ANTH P200	2/15/2019	Susan Alt
CARNIVORE CHEWING			ANTH P200	2/15/2019	Susan Alt
CUT MARKS			ANTH P200	2/15/2019	Susan Alt
GZ	Sheep	Humerus - L	ANTH P200	2/15/2019	Susan Alt
R11	Raccoon	See list	ANTH P200	2/15/2019	Susan Alt
RODENT GNAWING			ANTH P200	2/15/2019	Susan Alt
RODENT GNAWING			ANTH P200	2/15/2019	Susan Alt
SAWING			ANTH P200	2/15/2019	Susan Alt
8492	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
1310002	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
1310003	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
1310004	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
1310031	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
1910003	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
9640045	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
9640045	Bison	All	ANTH P399	2/25/2019	Laura Scheiber
9010051	Wombat	All	ANTH P602 project	3/15/2019	Madison Hinkle
9010052	Wombat	All	ANTH P602 project	3/15/2019	Madison Hinkle
8492	Bison	Femur	Animal MD, Wonderlab	6/14/2019	Sam Couch
8610108	Siberian Tiger	Cranium	Animal MD, Wonderlab	6/14/2019	Sam Couch
9310226	Whale	Vertebrae	Animal MD, Wonderlab	6/14/2019	Sam Couch
9330118	Catfish	Cranium	Animal MD, Wonderlab	6/14/2019	Sam Couch
9510043	River Otter	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
9610173	Giraffe	Cranium	Animal MD, Wonderlab	6/14/2019	Sam Couch
ARTICULATED	Cat	All	Animal MD, Wonderlab	6/14/2019	Sam Couch

ARTICULATED	Domestic Pigeon	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
ARTICULATED	Turtle	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
ARTICULATED	Fish	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
BB66	Chicken	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
D63	Chicken	All	Animal MD, Wonderlab	6/14/2019	Sam Couch
DARK TOWER	Pig	Mandible	Animal MD, Wonderlab	6/14/2019	Sam Couch
G78	Domestic Dog	Mandible	Animal MD, Wonderlab	6/14/2019	Sam Couch
0010277	Gray Fox	All	Angel Mounds	6/26/2019	Amanda Burt
0110011	Asian Black Bear	All	Angel Mounds	6/26/2019	Amanda Burt
0532507	Wild Turkey	All	Angel Mounds	6/26/2019	Amanda Burt
892117	Turkey Vulture	All	Angel Mounds	6/26/2019	Amanda Burt
894248	Spiny Softshell Turtle	All	Angel Mounds	6/26/2019	Amanda Burt
982258	Redhead Duck	All	Angel Mounds	6/26/2019	Amanda Burt
1610044	Common Rabbit	All	Angel Mounds	6/26/2019	Amanda Burt
8410119	Fox Squirrel	All	Angel Mounds	6/26/2019	Amanda Burt
8540101	Box Turtle	All	Angel Mounds	6/26/2019	Amanda Burt
8610194	Coyote	All	Angel Mounds	6/26/2019	Amanda Burt
9010009	River Otter	All	Angel Mounds	6/26/2019	Amanda Burt
9410072	Elk	All	Angel Mounds	6/26/2019	Amanda Burt
9810144	Muskrat	All	Angel Mounds	6/26/2019	Amanda Burt
9910233	Whitetail Deer	All	Angel Mounds	6/26/2019	Amanda Burt
A25	Beaver	All	Angel Mounds	6/26/2019	Amanda Burt
E47	Snapping Turtle	All	Angel Mounds	6/26/2019	Amanda Burt
J05	Raccoon	All	Angel Mounds	6/26/2019	Amanda Burt
J08	Opossum	All	Angel Mounds	6/26/2019	Amanda Burt

J84	Canada Goose	All	Angel Mounds	6/26/2019	Amanda Burt
K10	Red Tailed Hawk	All	Angel Mounds	6/26/2019	Amanda Burt
130191	Shovelnose Sturgeon	All	Redbud Hills Tour	7/19/2019	Sam Couch
130194	Stingray	All	Redbud Hills Tour	7/19/2019	Sam Couch
1710009	Grizzly Bear	Skull	Redbud Hills Tour	7/19/2019	Sam Couch
9330118	Catfish	Cranium	Redbud Hills Tour	7/19/2019	Sam Couch
9510380	Lion	Skull	Redbud Hills Tour	7/19/2019	Sam Couch
9610173	Giraffe	Cranium	Redbud Hills Tour	7/19/2019	Sam Couch
A17	Bison	Cranium	Redbud Hills Tour	7/19/2019	Sam Couch
D62	Gar	Skull	Redbud Hills Tour	7/19/2019	Sam Couch
10004	Ibex	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch
130101	Rainbow Parrotfish	Dentary, Pharyngeal	Mastodon Donor Tour	7/26/2019	Sam Couch
130155	Black Tipped Reef Shark	All	Mastodon Donor Tour	7/26/2019	Sam Couch
130191	Shovelnose Sturgeon	All	Mastodon Donor Tour	7/26/2019	Sam Couch
130194	Stingray	All	Mastodon Donor Tour	7/26/2019	Sam Couch
130281	Piranha	Skull	Mastodon Donor Tour	7/26/2019	Sam Couch
730155	Gar	Scales	Mastodon Donor Tour	7/26/2019	Sam Couch
1710009	Grizzly Bear	Skull	Mastodon Donor Tour	7/26/2019	Sam Couch
9070047	Horseshoe Crab	All	Mastodon Donor Tour	7/26/2019	Sam Couch
9210663	Porpoise	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch
9310226	Whale	Vertebrae	Mastodon Donor Tour	7/26/2019	Sam Couch
9330118	Catfish	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch
9510390	Lion	Skull	Mastodon Donor Tour	7/26/2019	Sam Couch
9610173	Giraffe	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch
A17	Bison	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch



CC16	Common Carp	Pharyngeal	Mastodon Donor Tour	7/26/2019	Sam Couch
D62	Gar	Skull	Mastodon Donor Tour	7/26/2019	Sam Couch
J25	Walrus	Cranium	Mastodon Donor Tour	7/26/2019	Sam Couch
T58	Sheepshead	Dentaries	Mastodon Donor Tour	7/26/2019	Sam Couch
ZZ331	Loggerhead Sea Turtle	Cranium, Scutes	Mastodon Donor Tour	7/26/2019	Sam Couch
9510272	Manatee	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
86100108	Siberian Tiger	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
AA44	Fisher	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
AA45	Fisher	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
AA46	Fisher	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
J70	Alligator Snapping Turtle	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
T59	Mata Mata	Cranium	Majors, Minors, and More Expo	8/22/2019	Sam Couch
UCB2001	Cat	All	Zooarch at UIndianapolis	8/25/2019	Sean Coughlin
UCB2001	Turkey	All	Zooarch at UIndianapolis	8/25/2019	Sean Coughlin
UCB2001	Canary Rock Cod	All	Zooarch at UIndianapolis	8/25/2019	Sean Coughlin
9810096	Deer	Mandible	TPS Fall enrichment	10/3/2019	Charli Taylor
Vincihi	Deer	Cranium	TPS Fall enrichment	10/3/2019	Charli Taylor
W89	Deer	Cranium	TPS Fall enrichment	10/3/2019	Charli Taylor
0110373	River Otter	Skull	ANTH P380	10/20/2019	Jeanne Sept
1710009	Grizzly Bear	Skull	ANTH P380	10/20/2019	Jeanne Sept
8610131	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept

8710038	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
8810003	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
8810113	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
8910040	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
8910200	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
9210081	Snow Leopard	Skull	ANTH P380	10/20/2019	Jeanne Sept
9310007	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
9310893	Sea Otter	Skull	ANTH P380	10/20/2019	Jeanne Sept
9510321	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
9510380	Lion	Skull	ANTH P380	10/20/2019	Jeanne Sept
9610045	Bison	Skull	ANTH P380	10/20/2019	Jeanne Sept
9710054	Grant's Zebra	Skull	ANTH P380	10/20/2019	Jeanne Sept
9810056	Black Bear	Skull	ANTH P380	10/20/2019	Jeanne Sept
9810105	Horse	Skull	ANTH P380	10/20/2019	Jeanne Sept
9810368	Black Bear	Skull	ANTH P380	10/20/2019	Jeanne Sept
9910092	Wolf	Skull	ANTH P380	10/20/2019	Jeanne Sept
9910173	Dog, St. Bernard	Skull	ANTH P380	10/20/2019	Jeanne Sept
A38	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
E46	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
G78	Dog	Skull	ANTH P380	10/20/2019	Jeanne Sept
G87	Raccoon	Skull	ANTH P380	10/20/2019	Jeanne Sept
J26	Polar Bear	Skull	ANTH P380	10/20/2019	Jeanne Sept
L26	Cat	Skull	ANTH P380	10/20/2019	Jeanne Sept
R38	Dog, Husky	Skull	ANTH P380	10/20/2019	Jeanne Sept
R64	Cow	Skull	ANTH P380	10/20/2019	Jeanne Sept

S79	Pig	Skull	ANTH P380	10/20/2019	Jeanne Sept
W04	Pronghorn	Skull	ANTH P380	10/20/2019	Jeanne Sept
10265	Raccoon	All	Thesis research	11/8/2019	Sidney Travis
20061	Domestic Turkey	All	Thesis research	11/8/2019	Sidney Travis
20216	Great Blue Heron	All	Thesis research	11/8/2019	Sidney Travis
20271	Tundra Swan	All	Thesis research	11/8/2019	Sidney Travis
20275	Peregrine Falcon	All	Thesis research	11/8/2019	Sidney Travis
210076	Black Bear	All	Thesis research	11/8/2019	Sidney Travis
210097	Eastern Cottontail Rabbit	All	Thesis research	11/8/2019	Sidney Travis
910049	Eastern Mole	All	Thesis research	11/8/2019	Sidney Travis
1110006	White Tailed Deer	All	Thesis research	11/8/2019	Sidney Travis
1120014	Saddle Billed Stork	All	Thesis research	11/8/2019	Sidney Travis
8540119	Diamondback Rattlesnake	All	Thesis research	11/8/2019	Sidney Travis
8910092	White Tailed Deer	All	Thesis research	11/8/2019	Sidney Travis
8920006	Wild Turkey	All	Thesis research	11/8/2019	Sidney Travis
8920399	Snow Goose	All	Thesis research	11/8/2019	Sidney Travis
9020018	Trumpeter Swan	All	Thesis research	11/8/2019	Sidney Travis
9220087	White Fronted Goose	All	Thesis research	11/8/2019	Sidney Travis
9610431	Red Fox	All	Thesis research	11/8/2019	Sidney Travis
9620066	White Ibis	All	Thesis research	11/8/2019	Sidney Travis
9720363	Red Tailed Hawk	All	Thesis research	11/8/2019	Sidney Travis
9940327	Speckled Kingsnake	All	Thesis research	11/8/2019	Sidney Travis
AA72	Gray Fox	All	Thesis research	11/8/2019	Sidney Travis
AA72	American Crow	All	Thesis research	11/8/2019	Sidney Travis
BB28	Ruffed Grouse	All	Thesis research	11/8/2019	Sidney Travis

BB44	Ruffed Grouse	All	Thesis research	11/8/2019	Sidney Travis
BB69	Ruffed Grouse	All	Thesis research	11/8/2019	Sidney Travis
EE06	Opossum	All	Thesis research	11/8/2019	Sidney Travis
GG16	Grey Squirrel	All	Thesis research	11/8/2019	Sidney Travis
J81	Canada Goose	All	Thesis research	11/8/2019	Sidney Travis
W07	Barred Owl	All	Thesis research	11/8/2019	Sidney Travis

Note: 2018 loans remained on-loan through 2019.

***2019 WRAZL Specimen Loans, to outside researchers (all still open loans)***

<b>CAT#</b>	<b>COMMON NAME</b>	<b>ELEMENT(S)</b>	<b>PURPOSE</b>	<b>DATE LOANED</b>	<b>LOANED TO</b>
9740053	Green Iguana	All	Research study	9/26/2019	Beth Reinke
9540291	Lau Banded Iguana	All	Research study	9/26/2019	Beth Reinke
9340479	Rhinoceros Iguana	All	Research study	9/26/2019	Beth Reinke
9440253	Common Chuckwalla	All	Research study	9/26/2019	Beth Reinke
9540064	Black Spiny-Tailed Iguana	All	Research study	9/26/2019	Beth Reinke
8492	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
0010085	Domestic Sheep	Hyoid	Research study	2/7/2019	Patrick Lubinski
0010270	Domestic Sheep	Hyoid	Research study	2/7/2019	Patrick Lubinski
0210089	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
1010047	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
1310002	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
1310003	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
1710002	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
9210356	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
9310764	Elk	Hyoid	Research study	2/7/2019	Patrick Lubinski
9410138	Domestic Sheep	Hyoid	Research study	2/7/2019	Patrick Lubinski

9410350	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
9510207	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
9510211	Elk	Hyoid	Research study	2/7/2019	Patrick Lubinski
9610045	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
9610352	Caribou	Hyoid	Research study	2/7/2019	Patrick Lubinski
9710078	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
9810010	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
9810035	Caribou	Hyoid	Research study	2/7/2019	Patrick Lubinski
9810423	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
9910001	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
9910213A	Domestic Goat	Hyoid	Research study	2/7/2019	Patrick Lubinski
A04	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
BICA 06-01	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
D82	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
G77	Cow	Hyoid	Research study	2/7/2019	Patrick Lubinski
GEARS10-1	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
GEARS10-2	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
GEARS10-3	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
J01	Moose	Hyoid	Research study	2/7/2019	Patrick Lubinski
J24	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski
01	Cow	Hyoid	Research study	2/7/2019	Patrick Lubinski
R27	Bison	Hyoid	Research study	2/7/2019	Patrick Lubinski
U71	White-Tailed Deer	Hyoid	Research study	2/7/2019	Patrick Lubinski

## 2019 Tours and Guests

The William R. Adams Zooarchaeology Laboratory saw 63 unique visitations and 199 guests visit the lab to use the collection, for interest in the collection and lab in general, to learn about volunteer opportunities, and/or for consultation, including several tours for school children and university students throughout 2019.

NAME	NO. OF GUESTS	DATE	PURPOSE
Sean Coughlin	1	1/18/2019	Loan of materials for class
Katey Evans	1	1/25/2019	Visitor
Pat Ryan	1	2/6/2019	Visitor
Jeremy Pennington	1	2/18/2019	Visitor
ANTH P200 Sections	30	2/20/2019	Lab Tours
Melanie Pennington	1	2/22/2019	Bone Drawing
Lindsey Simmons and Joe Pietrykowski	2	2/24/2019	Lab Tour
Fionn Connelly	1	3/22/2019	Anthropology distinguished lecture tour
Rebecca Barzilai	1	3/22/2019	Anthropology distinguished lecture tour
Christian Rice	1	3/22/2019	Anthropology distinguished lecture tour
Kent Lightfoot, UC Berkeley	1	3/22/2019	Anthropology distinguished lecture tour
Olivia Perisine	1	3/29/2019	Anthropology distinguished lecture tour
Justine Kaiser	1	3/29/2019	Anthropology distinguished lecture tour
Emily Thorpe	1	4/4/2019	Anthropology distinguished lecture tour
John Kearney	1	4/4/2019	Anthropology distinguished lecture tour
Alex Zimmerman	1	4/4/2019	Anthropology distinguished lecture tour
Roman Martinez	1	4/4/2019	Anthropology distinguished lecture tour
Kate Slabosky and Beth Flarrion	44	4/5/2019	Central Middle School, Class Visit from Columbus, Indiana
Polly Sturgeon	1	4/10/2019	IU Day
Peter Jacobs	1	4/10/2019	IU Day
Ben Johnson	1	4/10/2019	IU Day
Steven Smith	1	4/10/2019	IU Day
Della Cook	1	4/10/2019	IU Day
Jian Liu	1	4/10/2019	IU Day
Jeff, Oma, Jeffery, Aaron Jackson, Bean	5	4/10/2019	IU Day
Melissa Hinkle	1	5/3/2019	Family of Student Volunteer
Charles Hinkle	1	5/3/2019	Family of Student Volunteer
Polly Sturgeon	1	5/8/2019	Reviewing Collection Records for IU Bicentennial Project
Kim Bruner	1	5/15/2019	UITS Capital Assets to scan assets
Katey Evans	1	5/28/2019	Lab Tour
Jeff Rogers	1	5/31/2019	Troubleshooting Go!SCAN laptop for UITS
Elizabeth Owen	1	6/16/2019	Lab Tour
Kyle Luckey-Smith	1	6/16/2019	Lab Tour

WonderLab Animal MD Camp	25	6/21/2019	Science Kids - Youth Camp
Glenn & Donna Toney	2	7/18/2019	Redbud Hills Tour
Jimmy Swergert	1	7/18/2019	Redbud Hills Tour
Mary Thompson	1	7/18/2019	Redbud Hills Tour
Mark Ellis	1	7/18/2019	Redbud Hills Tour
Hannah Cain	1	7/18/2019	Redbud Hills Tour
Katelin Vesdy	1	7/20/2019	Redbud Hills Tour
Mark Wasser	1	7/20/2019	Redbud Hills Tour
Joel Stump	1	7/26/2019	Stump Family Tour
Jess H Stump	1	7/26/2019	Stump Family Tour
Carlie Smith	1	7/26/2019	Stump Family Tour
Parker Rumpfelt	1	7/26/2019	Stump Family Tour
Ella Ross	1	7/26/2019	Stump Family Tour
Kendal Ross	1	7/26/2019	Stump Family Tour
Mya Taylor	1	7/26/2019	Stump Family Tour
Luke Smitt	1	7/26/2019	Stump Family Tour
David Polly	1	8/19/2019	CBRC Meeting
Claudia Johnson	1	8/19/2019	CBRC Meeting
Katey Evans	1	8/21/2019	Lab Tour
Stephanie Evans	1	8/21/2019	Lab Tour
Lindsey Mattern	1	8/30/2019	Set up collections manager position for fall 2019
Jackie Page	1	9/3/2019	Lab Tour
Laura Zarb	1	9/3/2019	Lab Tour
Christina Friberg	1	9/9/2019	GBL bone analysis with Dr. Scheiber
Victoria Martine	1	9/13/2019	Visitor
Rosie Motz	1	9/13/2019	Scanner pickup
Gary Motz	1	9/20/2019	Scanner pickup
Mirah Richey	1	9/20/2019	Lab Tour
Christina Friberg	1	9/20/2019	GBL bone analysis with Dr. Scheiber
Jonah Williams	3	9/27/2019	Lab Tour
Joe Zimnawson	1	11/11/2019	Lab Tour
Amanda Pavot	1	10/11/2019	Processing workshop
Lauren Schumacher	1	10/11/2019	Processing workshop
Maclaren Gutharie	1	10/11/2019	Processing workshop
Anne Hittson	1	10/11/2019	Processing workshop
Anna Hinkle	1	10/14/2019	Lab Tour
Mark Christenson	1	10/18/2019	Lab Tour
Joe Elkins	1	10/19/2019	Lab Tour
Elizabeth Kramer	1	10/22/2019	Lab Inspection
Makayla Lauderdale	1	10/24/2019	Lab Tour
Karen Edwards	1	10/24/2019	Lab Tour
Cecelia Vitela	1	11/1/2019	Lab Tour
Brandon Wong	1	11/1/2019	Lab Tour
Joe Elkins	1	11/7/2019	Lab Tour
Sidney Travis	1	11/8/2019	Research Project from Ball State
Sean Coughlin	1	11/8/2019	Research Project from Ball State
Dachys Clevarus	1	11/8/2019	Research Project from Ball State

IU Physical Plant	1	11/8/2019	Freezer Maintenance
IU Physical Plant	1	11/8/2019	Freezer Maintenance
Michael Randal	1	11/22/2019	Lab Tour
Juno Martin	1	11/22/2019	Lab Tour
David Polly	1	11/26/2019	Skeleton photos
Harley Bailey	1	12/4/2019	Natural History Collections Club Meeting
Emily Thorpe	1	12/4/2019	Natural History Collections Club Meeting
Polly Sturgeon	1	12/4/2019	Natural History Collections Club Meeting
Shalom Drummond	1	12/4/2019	Natural History Collections Club Meeting
Kimberly Cook	1	12/4/2019	Natural History Collections Club Meeting
Aditya Srinath	1	12/4/2019	Natural History Collections Club Meeting
Chris Evans	1	12/16/2019	SCU Staff/ Student
Chandler James	1	12/16/2019	Lab Tour
Gabi Faya	1	12/17/2019	Lab Tour
Skylar Grant	1	12/17/2019	Lab Tour