2015 Annual Report of Field Excavations in Eastern Pondoland
ECPHRA Permit No. 2/2/APM-PERMIT/15/03/001-

PROJECT GOALS

The P5 Project is focused on understanding when, why, and how coastal foraging was developed by hunter-gatherers during the Pleistocene; if coastal foraging was facilitated by prior cognitive changes in modern humans; if nutrient-rich sea foods contributed to cognitive changes in modern humans; or if something else happened. Answering these broad research questions depends upon having long-term and continuous records of coastal foraging that span both glacial and interglacial phases. However, current records of coastal foraging are unambiguously patchy on account of climatically-linked changes in sea levels and coastlines, which have limited our current understanding of coastal foraging almost entirely to inter-glacial and later time periods. Almost nothing is known about earlier time periods like glacial Marine Isotope Stage 6 when the modern human lineage developed.

Our research project is the first to specifically target areas where sea level and coastline changes would not have been a major influence on hunter-gatherer access to coastal resources, thereby facilitating the development of continuous records of coastal foraging. The primary goal of this research project is to find and study archaeological sequences that will allow us to develop long-term and continuous records of coastal foraging. These records will allow our research team to test long-standing questions about when, where, and how coastal foraging developed and better understand the broader impact it had on modern human origins. In particular, we will be able to test for the first time several competing hypotheses about the origins and development of coastal foraging thereby contributing to our knowledge about the survival and adaptation of the modern human lineage in Africa. Specifically, we intend to focus upon resolving chronological, chronometric, and behavioral questions about coastal occupation and foraging during and across glacial and interglacial phases.

2015 RESEARCH OBJECTIVES

Our specific objectives during the 2015 field season were as follows:

1) Conduct test excavations at 4 archaeological sites:
    a. Describe the excavated stratigraphic sequences and identify potential problems that will complicate more intensive future excavations and the ultimate development of long-term and continuous archaeological sequences (e.g. eroded or altered deposits by natural events, people, or animals)
    b. Collect geochronological (optically stimulated luminescence) and radiocarbon samples to date the deposits.
    c. Collect sediment samples from every excavated sedimentological deposit and test for ancient pollen and phytoliths, which will provide key information about paleoenvironmental changes.
2) Excavate a sample of archaeological deposits from each site:
    a. Collect all excavated archaeological materials to better understand the nature of the archaeological deposits.
    b. Analyze the stone artifacts to understand local hunter-gatherer technology and provide a culture-historical reference to nearby archaeological sequences.
    c. Analyze the marine and terrestrial fauna to understand paleoenvironmental changes and hunter-gatherer economies.

3) Conduct broad landscape transects across the study area and collect samples of modern sediments to better characterize the distribution of modern plant pollen and phyotoliths across the study area. Use this information to refine the analysis of the archaeological pollen and phytolith samples.
4) Conduct geomorphological study of the modern coastline to understand the character, magnitude, and timing of palaeo sea levels and the response of sedimentation to these fluctuations, which is critical in piecing together coastal evolution.

RESEARCH ACTIVITES

Our research team conduct test excavations at four of our highest-priority sites in Pondoland, South Africa from September-November 2015. The research was funded by the United States National Science Foundation. Our criteria for being considered for test excavations included the abundance and diversity of stone artifacts; the presence of marine and terrestrial plant and animal remains; and inferences that we could make about the sediment depth and stratification based on natural erosional profiles and the geomorphic configurations of the rock shelters. We used a Topcon Hiper XT RTK GNSS system to precisely survey control points at each of the study sites in the UTM coordinate system (WGS 1984). These control points were then used to resection each of our two on-site reflectorless total stations so that we could map the contours of the sites, rock shelter walls and geomorphic features, as well as all excavations, including stratigraphic contacts and surfaces and specialist samples for dating, geological, and archaeobotanic analysis. Our test excavations were dug in 50 cm x 50 cm quadrants following natural stratigraphy. All excavated sediments were collected and have been transported back to our laboratory at the East London Museum for wet-sieving. Here is a site-by site breakdown of our research activities:

Site A2SE-1: We surveyed 15 control points with centimetric precision around the site and establish a geodetic grid for our current and future field season. We mapped the surface of the rock shelter and the rock shelter walls with over 980 points. We conducted two text excavations, one being 50 cm x 50 cm and the other being 50 cm x 70 cm. Both stratigraphic sequences are ~40 cm deep with abundant rocky intertidal shellfish, stone artifacts, and fauna with intermittent macrobotanic preservation and charcoal. Macrobotanic preservation was especially well-preserved at the base of one of the excavations. We have collected numerous charcoal samples for radiocarbon analysis as well as 4 optically stimulated luminescence (OSL) dating samples, which will be used to date the stratigraphic sequences. 27 sediment samples were also collected for pollen and phytolith analysis. Additionally, we collected 2 micromorphology samples at key contacts from each of the test excavations, which will help us understand the nature of the deposits.

Site A3NW-8: We surveyed 13 control points with centimetric precision around the site to establish our geodetic grid for current and future work at the site. We collected over 850 points of the rock shelter floor and walls to model the site. We excavated three 50 cm x 50 cm areas with the deepest excavations reaching ~60 cm. However, in spite of finding abundant stone artifacts and faunal remains scattered across the shelter floor, the excavated sediments were archaeological sterile, save for the top ~5 cm where occasional artifacts were found. We also collected 2 OSL samples to date the sediments as well as 10 sediment samples for pollen and phytolith analysis.

Site C4NE-1: We surveyed 20 control points around and within the site at centimetric accuracy. We mapped the rock shelter surface and walls with over 2,000 points. We excavated 4 50 cm x 50 cm areas with the deepest test excavations reaching ~70 cm below the current shelter surface. The stratified archaeological sequences all contained stratified abundant shellfish, stone artifacts, and terrestrial faunal remains. Charcoal was very rare, but we did collect numerous OSL dating samples alongside several micromorphological samples and sediment samples for archaeobotanical analysis. One test excavation quad was stopped at ~20 cm after articulated human remains were discovered, documented, and carefully reburied. We collected 3 micromorphological samples from the 3 excavated stratigraphic sections as well as 4 OSL samples to date the sediments. In addition, we collected 63 sediment samples for pollen and phytolith analysis.

Site B4NW-1: We surveyed 11 control points around the site at centimetric accuracy and we mapped the surface of the site with over 1,000 points. Our preliminary single-grain OSL ages from 2011 showed that the paleosols at B4NW-1 date to ~300 ka and ~130 ka (Fisher et al., 2013). We put our main 1 meter x 3 meter test excavation at location where we expected to intersect the contact between these two sedimentological deposits. In addition to finding the contact, we also uncovered a previously unrecognized sedimentological unit stratified in between the two paleosols. Stone artifacts were rare within the excavated sediments. Elsewhere on the site, our lithics specialist, Justin Pargeter (SUNY Stony Brook), systematically mapped all of the artifacts (n = 161) from a 4 meter x 4 meter lithic scatter so that we can better understand the erosional processes at the site. We also mapped a dense MSA occupation surface (n = 364) complete with refitting stone artifacts. We also collected 6 OSL dating samples from the excavations and key sedimentological units as well as 3 micromorphological samples.

In addition to the archaeological excavations, one of our archaeobotanic specialists, Irene Esteban (University of Barcelona), surveyed across much of our study area, collecting multiple long transects of modern soils and cross-cutting each of the main vegetation types. These soil samples will be used by our archaeobotanic team members (Frank Neumann—University of Munster, Marion Bamford—University of the Witswatersrand, Rosa Albert—University of Barcelona, and Irene Esteban) to characterize the modern distribution of plant pollen and phytoliths across the landscape as we proceed to study the archaeological macrobotanic and microbotanic remains in the future. Our project geologist, Hayley Cawthra (South African Council for Geoscience), also spent a considerable amount of time surveying the study area and collecting geological samples that will give us a better understanding of the coastal geomorphic history across the study area. HC is also working closely with JP to determine the causes and rates of chemical erosion that is affecting many of the artifacts that are made on dolerites and shales.

All of our collections are now being processed in our laboratory at the East London Museum and analysis of our materials is ongoing, which includes studies of the archaeomalacology (Antonieta Jerardino—Pompeu Fabra University); lithic artifacts (Justin Pargeter, Matthew Sisk—University of Notre Dame); luminescence dating (Zenobia Jacobs—University of Wollongong); magnetic susceptibility (Andrew Herries—LaTrobe University); micromorphology (Hayley Cawthra); modern ecology (Jan Venter—Nelson Mandela

Metropolitan University); micromammals (Thalassa Matthews—University of Cape Town); and terrestrial faunal (Jamie Hodgkins—University of Colorado, Denver) specialists.

RESULTS

Due to the timing of our field season relative to this report, all analyses are currently pending. We have submitted an application to export dating and sediment samples from the East London Museum, which was submitted by E. Fisher on March 2016. If approved then the sediment samples will be sent to University of Witwatersrand whereas the dating samples will be submitted to SAHRA for a permit to export them outside of the country for dating analysis.

We do have data from our stone artifact analyses to suggest that the deposits at site A2SE-1 (Waterfall Bluff) may span the Terminal Pleistocene and perhaps the Last Glacial Maximum. If this is confirmed by radiometric dating then these deposits would provide the first ever archaeological deposits showing coastal foraging during a peak glaciation in southern Africa. It would also provide a unique insight into coastal hunter-gatherer adaptation and subsistence during a glacial phase and assist in developing a long and continuous understanding of coastal foraging, which is a key goal of this research project. However, our stone artifact results must be treated cautiously until our radiocarbon and OSL age analyses are completed.

At site B4NW-1, we also have suspicion to believe that the MSA artifacts from the dense occupation surface, which we mapped, date to the time between 300,000 years ago and 130,000 years ago. Our analyses of the OSL dating samples of these sediments is pending, however, if our suspicions are correct then we would have data spanning another, and much older glacial phase—one that also spans the origins of the modern human lineage.

Lastly, at site C4NE-1, we uncovered articulated human remains. A portion of a left os coxa, including the acetabulum and an articulated femur were uncovered ~20 cm below the current surface of the rock shelter. The femoral head and neck and greater trochanter exhibited damage, which extends to the lower lateral surface of the femoral shaft and around the lateral condyle. Cortical bone on the lateral condyle exhibited extensive damage and the trabecular bone was exposed. The femur exhibited postmortem breakage in two places along the shaft. Damage to the bones could be cause by degradation over time, contributed to by sediment compaction and likely trampling of the sediments by humans and animals, but this speculation would need to be investigated in more detail. The preservation of the bones was probably affected by local environmental conditions, which may include burial in acidic soil, but environmental factors will have to be tested at a future date. Portions of the patella and the tibia were also visible, but not excavated. The burial was associated with marine shell and stone artifact-rich sediments. Pottery was found in overlying levels, but not in association with the burial. There were no diagnostic artifacts that could be used to determine the age of the deposits or individual. If the individual predates the arrival of Iron Age pastoralists then future study of the remains could provide detailed information on coastal hunter-gatherer subsistence (isotopic analysis), pathology, and possibly also genomics. The remains were not excavated. Upon discovery, E. Fisher contact Mr. V. Mapiya (Head of Mkambati Nature Reserve), Mr. S. Mokhanye (ECPHRA) and Mrs. C. Booth (Albany Museum) to notify them of the findings. Local police were also notified, as were representatives of the local community. The exposed skeletal

remains were mapped, photographed, and then small sandbags were carefully placed around the remains to protect them. Subsequently, the remains were reburied and remains fully covered and protected.

CURRENT PROGRESS

We are currently prepping samples for analysis, which also includes requesting permission from ECPHRA and SAHRA to export materials from our laboratory in the East London Museum as well as from South Africa. When the permits are available we will ship our OSL, radiocarbon, micromorphology, pollen, phytolith, and magnetic susceptibility samples to the respective specialists and proceed with their analyses.

LOCAL PROFESSIONAL DEVELOPMENT

During our 2015 field season we spent a considerable amount of time developing a robust interaction with South African scientists, students, and local communities. In fact, one half of our senior scientists on the P5 Project are South African. We have also partnered with the SACP4 Project (Principal Investigator, Dr. Curtis Marean) and MAP-CRM (co-Directors, Dr. Curtis Marean and Mrs. Bettina Gennari) in Mossel Bay to work with their highly trained South African crew. This past field season we worked with two of MAP-CRM's most experienced excavators, Mr. Bonile Mjacu and Mr. Lwando Maxidolo, who also speak fluent isiXhosa, and we were able to begin training local amaPondo recruits about archaeological excavation.

DATA DISSEMNIATION

We have partnered with the East London Museum where we are working with museum staff to develop modern, multi-lingual education exhibits about the prehistory of the Wild Coast. Towards that goal, we have also begun a collaboration with NGT Consulting (Director, Mr. Nkosinathi Tomose) to translate our research publications and educational outreach into isiXhosa. P5 members have also maintained regular contact with the community leaders from Mkambati and Lambasi, informing them of our results, plans, and preparations. This past field season we even worked closely with the traditional chief of the Lambasi amaPondo, Nkosi Mthuthuzeli Mkwedini, to provide 100 chairs for their local community in lieu of a traditional fee to camp on their land and to help support the communities who supported us during our field research.