

ABSTRACTS

1st International Workshop on Historical Ecology: The Next Generation

Glynis Humphrey, PhD student at Plant Conservation Unit, University of Cape Town

The role of humans in the complex fire, climate, and vegetation regimes of north-east Namibia

Human use of fire is rooted in Africa's historical and current fire regimes. Contemporary fire literature describes rural communities as the primary cause of wildland fires. The occurrence of such fires, however, whether caused naturally or by human intervention, is also influenced by prevailing ecological conditions such as vegetation type and status and climatic trends. The question remains how human, ecological and climatic interactions drive the occurrence and extent of fires in southern Africa. This research aims to explore the human-ecological-fire regime interface, past and present, to understand the complex social-ecological circumstances in north-east Namibia.

The objective of this study is to identify and elucidate spatial variation and temporal trends of fire events in relation to human land use practises, climatic variation and vegetation history over the last century. During the 20th century, prior to Independence, this area was subjected to three decades of war, inter - ethnic conflict, deforestation, and ensuing resultant pressures over diminishing natural resources for rural communities. Since Independence (1990) community based natural resource management initiatives (CBNRM) and Government designations of multiple land-use zones have been implemented to increase livelihood options and food security.

The study will use ground survey methods, historical aerial photography, remotely sensed fire products and palaeoecological techniques. Social methods will include local knowledge surveys with Khwe-San communities, and interviews with Namibian fire management stakeholders. Multi-disciplinary hypotheses will be tested to gain an understanding of the climatic, ecological and human influences on the fire regime. Models which encompass the complexity of historical and contemporary ecological-human influences on wildland fires are required to understand and address adaptive fire management strategies within southern Africa. This presentation will discuss the complex issue of combining human, climatic and ecological fire regime characteristics into an adaptive fire management tool for north-east Namibia.

Anna Shoemaker, PhD student at Department of Archaeology and Ancient History, Uppsala University

Reexamining the history of human environmental interactions in Amboseli basin, Kenya

The Amboseli basin is increasingly understood as a landscape intrinsically connected to the traditional pastoral lifeways of the Maasai. However, upon examination, the assertion that the Maasai of Amboseli are timeless paradigms of sustainable resource husbandry is an ahistorical perspective.

In this presentation I will introduce my doctoral research on the pre-colonial history of Amboseli. I will discuss results from examination of the distribution of artifacts collected during archaeological survey, and the placement of pastoral settlements identified in historical aerial photos. Preliminary findings suggest a longer-term pattern of landscape use in Amboseli National Park divergent from that of contemporary pastoral lifeways.

This research is motivated by current deficiencies in our historical understanding of settlement and continuity on this landscape.

Kristina Berglund, Master Student in Global Environmental History, Uppsala University

Peace Parks: history, rationales, potential

In an attempt to combine my focus on nature conservation in the GEH master program with my previous training in peace- and conflict studies I seek in my thesis to analyze peace parks, or transboundary conservation areas (TFCAs).

A TFCA is an ecological region that straddles frontiers between of two or more countries, encompassing one or more protected area. The history of peace parks can be traced back to the 1930's but there has recently been a revitalization of the idea. In 1997 the Peace Parks Foundation (PPF) was established whose vision was to create the ultimate form of nature conservation through unique TFCAs in Africa encompassing millions of hectares. PPF states that peace parks are about "co-existence between humans and nature, about promoting regional peace and stability, conserving biodiversity and stimulating job creation"... "It's an African success story that will ensure peace, prosperity and stability".

But the concept of peace parks challenges deeply rooted historical assumptions about conservation areas, which often have been considered a source of conflict themselves. Some scholars argue that it is another form of 'green imperialism': a top-down, market-oriented environmental intervention pushed on Africa.

My aim is therefore to scrutinize the visions of PPF and to analyze the rise of peace parks as a phenomenon by examining how peace parks are described and motivated by different scholars and involved stakeholders. I want to understand the ideological, political and economic rationales for peace parks and explore what methods have been used to fulfill the visions.

Through this I wish to gain insight on what difficulties and potential this idea might include, both in terms of nature conservation, human development and peace-building. Are the visions of peace parks empty words or guidelines that govern action? Are peace parks a feasible idea for peacebuilding and protection of biological diversity?

Andrea Kay, PhD Student at the Institute of Earth Surface Dynamics, Faculty of Geosciences and Environment, University of Lausanne

A classification of subsistence lifestyles and land use in prehistoric Africa

The Iron Age in sub-Saharan Africa is characterized by not only the appearance of metallurgy, but in many areas also the first widespread establishment of agricultural societies. The shift from foraging to farming and metallurgy in Africa fundamentally altered the relationship between humans and their environment, and may have had widespread consequences for regional climate and hydrology, which in turn could have had feedback effects on human populations. During the period from approximately 1000 BCE to 1500 CE, the Iron Age spread episodically from West Africa east and south, with periods of rapid spread interspersed with stagnation and even abandonment of agricultural lifestyles. Theories for this sporadic transition range from exogenous environmental factors and mass migrations, to animal disease distributions and endogenous niche construction in response to growing populations. The Quantifying the economic and environmental transformation of Africa during the Iron Age (ACACIA) project seeks to explore this problem through the use of integrated human - environment models. As a first step towards developing these models, this paper presents a societal - subsistence based classification of land use in sub-Saharan Africa during the Iron Age. Each category in the classification considers environmental, geographic, temporal, and technological attributes, but also allows for some variation within each category. The classification is based on a broad synthesis of published archaeological, archaeobotanical, and ethnographic observations, and illustrates the various degrees of land use intensity employed by different groups at different times, e.g. wild-forage, herding, vegetable or cereal crops, and the firing of pottery or iron metallurgy. Our classification scheme will inform the development of models that will be used to quantify the impact of Iron Age Africans on their local and regional environments, and test hypotheses about the importance of human agency for the development of African environments over the late Holocene.

Ryan E. Hughes, Research Assistant, Université de Lausanne Institute for Earth Surface Dynamics

The third land use revolution: The environmental impact of the Bronze Age

Similarly to fire and the domestication of plants and animals that preceded it, the development of metallurgy in prehistoric Eurasia fundamentally altered the relationship between humans and their environment. Starting more than 5000 years ago with copper in southwest Asia and the Eastern Mediterranean, and later through the invention of bronze, metallurgical technology ushered in the 3rd “land use revolution”. Metal tools facilitated the conversion of forests to agricultural and pastureland and allowed both the intensification and expansion of farming activities. The Bronze Age is associated with the development of the first complex societies across Eurasia, and the development of long distance trade networks. At the same time, metallurgy produced a completely novel demand for ore and wood for fuel in the smelting process, both of which had widespread impacts on landscapes, importantly through deforestation and soil erosion. Despite this general understanding of the importance of the Bronze Age for humanity, the potential impact that early metallurgy had on continental-scale landscapes is uncertain and highly debated. To address this problem, we use a combination of archaeological and palaeoecological data synthesis and modeling to quantify the potential impacts of bronze metallurgy in Eurasia during the period 3000 -1000 BC. We start by reviewing the evidence for copper and bronze agricultural and forestry implements in the archaeological record and compiling a geo-database of finds. Copper and bronze agricultural implements such as sickles, ploughshares and reaping hooks along with multi-purpose tools such as saws and axes are commonly found in the archaeological record, dispelling the popular assertion that bronze was primarily used for ornamental and competitive purposes. By 1200 BC, bronze agricultural and forestry tools are found from the United Kingdom to Russia and from Scandinavia to the Sahara. The information we collect in the archaeological geo-database will be applied to a new model of human-environment interactions that predicts land use and land cover change as a function of technology, environment, and social organization. These model results will in turn be evaluated against the land cover reconstructions based on pollen data, which intriguingly show the first large-scale deforestation in Europe occurring during the Bronze Age. Ultimately, our study will demonstrate the importance of metallurgy as the 3rd land use revolution, and the development of the landscapes we value today as economic, cultural and ecological resources.

Rebecca Kariuki, PhD Candidate, Environment Department, University of York

Modelling Past, Present and Future Ecosystem Dynamics and Societal Interactions in East Africa

East Africa ecosystems are highly diverse ecosystems with four of the thirty four global biodiversity hotspots. They are formed by interaction with changing climate, human population, fire and wildlife. Many studies have shown a strong connection between people and the ecosystem. However, ecosystems in East Africa have changed immensely over time due to urbanization, increase in subsistence farming, human population growth and climate change among others. Modification in the ecosystems leads to modification of ecosystem services critical for livelihoods and national development. Reconstructing past and present human-ecosystem interactions is therefore vital for predicting future interactions.

The objective of my study is to assess the past and present response by societies, landscapes and ecosystems in East Africa to climate change and to develop methods of assessing the best way developed models can be used in East Africa environmental forecasting.

Research will be done in tropical savanna ecosystems in East Africa. These ecosystems support a large proportion of human population and a majority of their livestock. Both satellite and field data will be gathered and analyzed. Data on variables such as temperature, rainfall, land cover and leaf area index among others will be derived from satellites while dry and wet season vegetation data will be collected through field work.

My research will provide a clear exposition on changes in the provision of ecosystem services in East Africa due to climate change and how these changes affect human-ecosystem dynamics. It will also produce predictive scenarios that will be used to define future environmental, social and economic changes. These scenarios can be used to assess the changes in ecosystem service provision and to set development targets. My research will also unveil new methods for assessing how predictive scenarios can best be used for environmental forecasting in East Africa.

Megan Hicks, PhD student in Archaeology at City University of New York

Community and Conservation: long term hunting and egg collection of wild birds in Myvatn Northern Iceland

Farms in the inland, lakeside Mývatn region of N. Iceland, contain extensive wild bird nesting grounds and the harvest of eggs and hunting has been a traditional way of utilizing the local wild bird populations since the first settlements (AD 871). This paper brings together new archaeological evidence from the long term farm of Skútustaðir with archival research, ecology, and ethnographic interviews to rediscover and document the full 1100 years of management of wild birds in the region, which appears to have been sustainable. Further, we consider contemporary conservation contexts as part of this long term tradition to which such scholarship can contribute.

Konrad Smiarowski, PhD Candidate in Archaeology, Department of Anthropology CUNY

Resilience, Sustainability and Collapse in Norse Greenland

Changes in climate regimes have played a significant role in the cultural settlement patterns of Greenland for several millennia. This presentation focuses on the Norse Settlement ca. 985 -1450 CE and how the terrestrial and marine (wild and domestic) animal resources were utilized, managed and modified in the face of climatic and environmental changes at all levels of the Norse social strata. Datasets from small tenant farms and shielings such as E74 Qorlortorsuaq and E168 , middle size independent farms like E172 Tatsipataa and E171 Tasilkuloq, and magnate farms like E29N Brattahlid and the Bishop's See at E47 Gardar (Greenlandic center of power), are utilized to understand the site specific, local, and regional management strategies and the level of their long-term sustainability. The Eastern Settlement strategies are compared with parallel data from the Western Settlement; small site W48 Niaqussat, middle size farm GUS (Farm Beneath the Sand) and a high status chieftain manor at W51 Sandnes. Their comparison aids in understanding the collapse of the whole Norse colony, a century after the abandonment of one of its two core components, the Western Settlement.

Chelsey Geralda Armstrong, PhD Student, Department of Archaeology Simon Fraser University, Vancouver Canada

The Ecological and Social Contexts of Traditional Resource Management: *Corylus* (spp.) in the Pacific Northwest

Traditionally, wild and managed plants were central to the diet, technology and worldviews of the people of the Pacific Northwest. However, shifting lifeways imposed by colonialism have changed the way plants are perceived and remembered. By focusing on native *Corylus* spp. (hazelnut), this research will integrate archaeological surveys, fire history data, modern genetics and ethnoecological interviews to better understand the cultural and ecological significance of hazelnut in the Pacific Northwest of Canada.

There is some recent memory of Indigenous hazelnut harvest in British Columbia, and shell fragments (nut and pericarp) are ubiquitous archaeologically. Linguistic evidence supports the hypothesis that ancient long distance transport of hazelnut from the southern Salish region of British Columbia to the northern Kitsumkalum, Gitksan and Wet-suwet'en region resulted in an ecologically disjunct population in the north. Hazelnut was traditionally managed by fire and had numerous ethnobotanical uses including for food (nut), for fuel (oily shells), and technology (dyes and weaving). By combining diverse kinds of data and knowledge to understand the historical ecology of this one culturally significant plant, we gain insights into the multi-dimensional ways in which peoples interacted with, and related to the biophysical world.

Ezekial Mtetwa, PhD student at Uppsala University, Department of Archaeology and Ancient History

Anthropogenic Landscapes: a historical ecology of iron and fuel provisioning systems in Great Zimbabwe urbanism, 800-1900 A.D.

This PhD project explores local encounters between technology and ecology during Great Zimbabwe's participation in global processes of the first and second millennium A.D. The size of this urban settlement and its significance as a political, religious and trading centre imply that considerable supplies of finished ceremonial and utilitarian metal objects and wood-charcoal would have been required. The long history of research on Great Zimbabwe has overlooked aspects of this human-plants interaction. The current and previous researches have recovered sites and artifacts that suggest the sophistication of this industry and wood-harvesting practices. The study enfolds concepts and approaches in historical ecology to highlight human agency, through their daily decisions and actions, in transforming nature in Great Zimbabwe. Archaeometallurgical and archaeobotanical data are jointly analyzed to infer long-term technological change and variation and the associated range of plant species exploited. From the data, inference is made towards understanding mutual influences between a dynamic metal industry and specific wood taxa selected for fuel and techno-medicine purposes. Preliminary results from analyzed charcoal samples recovered from one of the large-scale ironworking sites around Great Zimbabwe suggest movement of *Colophospermum mopane* charcoal across the Great Zimbabwe urban landscape for industrial purposes. With this as a lodestar, this research sets out to illuminate valuable human-plants interactions in iron and fuel provisioning systems of Great Zimbabwe and the impact this might have had on the environment. Finally, the study posits that historical ecology's emphasis on human actions in disturbing nature offers an optimistic and pragmatic alternative of conceptualizing how we live and shape nature. Human actions become directly accountable for environmental transformation and equally responsible for solutions to vicissitudes of any negative changes. Already, the United Nations International Year of Global Understanding (IYGU) has alluded to the centrality of human actions in bending and mending nature.

Michiel de Haas & Kostadis Papaioannou, PhD Candidates, Rural and Environmental History, Wageningen University

Climate, scarcity and inter-communal violence and conflict in Sub-Saharan Africa: Evidence from colonial British Africa (1920-1939)

While optimism about Sub-Saharan Africa's recent economic performance is widespread, episodes of tragic violence across the continent still abound, most recently in coastal Kenya, northern Nigeria, South Sudan, the Central African Republic and Mali. Conflict often surfaces in ecologically vulnerable rural areas which are highly dependent on rain-fed agriculture, have limited access to markets and trade, and are noted for the absence or fragile presence of the state.

Previous research has proven a significant and robust relationship between weather shocks and (violent) conflict, in societies dependent on rain-fed agriculture. The causal mechanism runs from extreme weather to failed harvests to increased competition over scarce resources and ultimately to conflict. Less is known, however, about the exact conditions under which weather shocks are less or more likely to trigger conflict in these societies.

In our paper, we conduct a historical case study of ten British African territories during the mid-colonial period (1920-1939). To capture variation in conflict, we have exploited archival data to construct an annual time series on the provincial and district level of numbers of persons admitted to prison, including the reason for, as well as the duration of their imprisonment. To measure conflict intensity we take the annual deviation from the long-term mean of number of prisoners admitted. To measure weather shocks, we have collected annual rainfall data from local meteorological stations and take the deviation from the long-term annual mean.

Our first results suggest a "U-shaped" relationship between rainfall deviations and violence, meaning that the latter is triggered by both drought and excessive rainfall. We also find tentative evidence that the relationship between weather shocks and conflict is weaker in areas participating in the production of export crops. As this work in progress, further results are expected to come out of the analysis in the next few months.

Erika R. Hoffman, Masters Student, Programme in Sustainable Development, Uppsala University and SLU

A Cultural Shift to Sustainable Agriculture

Classic social science theory developed by Thomas Robert Malthus and F.C. Wallace set the stage for a deeper analysis of the transitional phase currently affecting our agricultural systems. Malthus' work regarding population theory and Wallace's interpretation of revitalization movements lend themselves to an in depth study of the drivers of the sustainable agriculture movement. Through examining modern case studies of sustainable agricultural initiatives through an anthropological lens, it is possible to identify specific actors, both individuals and groups that influence the cultural change in this sector. This research uses the theory of revitalization as a framework to determine both the main impetus for these cultural changes and the agents pursuing sustainable forms of agricultural production and consumption. There are multiple actors at play within the sustainable agriculture movement. Within a variety of groups studied, individuals are the first actors to move toward supporting sustainable agriculture initiatives, whether through individual purchasing power or leadership with an organization. Social agency is derived from a small group of individual actors who function within a community, extending the action to a larger network and subsequently allowing for institutional changes to occur within the modern human cultural system. Using revitalization movements as a framework for this study provides a medium through which researchers can better understand the human need for a transition to sustainable agriculture and the ways in which social agency affects this process.

Oliver Boles, PhD researcher, UCL Institute of Archaeology

Lasting Impressions: the enduring effects of pastoralist settlement in the eastern African savannah and their archaeological implications

Contrary to the commonly held belief that the presence of pastoralism has had an overall deleterious impact on the savannah environment of eastern Africa, various studies have shown that while herder settlements can have a lasting impression on the African landscape, this should not be assumed, a priori, to be negative. For instance, concentrated dung deposits within livestock enclosures have been shown to initiate nutrient hotspots with levels of biodiversity that can far outweigh the surrounding "natural" landscape. In addition, it is increasingly recognized that typically-ecological data, such as soil-chemical and vegetation distributions, might constitute a surrogate archaeological record, by which spatial context as commonly available in sites with lengthier occupation histories might also be inferred with respect to the more transient encampments associated with livestock economies. Data from the Pastoral Iron Age site at Mili Sita in the Lolldaiga Hills of central Kenya (AD 1640-1730) shows distinct variation in soil chemistry, micromorphology and vegetation patterns, not only between the site and its surroundings but also within the site itself. This paper highlights how these datasets might be linked with the results of more traditional archaeological investigation to explore the enduring ecological legacy of these ephemeral settlements, and how this might contribute improved spatial context. Patches of *Cynodon Plechtostachyus* grass are visible across the site today, and soils within these patches yield geochemical and micromorphological signatures suggestive of relict livestock enclosures. Ongoing research attempts to identify potential signatures for other features commonly associated with pastoralist settlements, such as hearths, gateways, and domestic structures. Environmental data is complemented by preliminary carbon and oxygen stable isotope analyses of sequentially sampled cattle tooth enamel; provisionally, this data points to perennial rather than seasonal occupation at Mili Sita, with herd management strategies such as birthing regulation commensurate with a specialist subsistence economy, such as that of the modern Maasai.

Lindsay Duncan, Research student at Institute of Archaeology, UCL

A multi-scalar, interdisciplinary approach to long-term environmental change at a coastal Maya site

The site of Marco Gonzalez on Ambergris Caye, Belize is characterised by a distinctive soil profile and vegetation suite that appear to have been strongly influenced by cultural material deposition, via the alteration of available soil formation parent materials. Of particular note are the fertile, dark earth top soils that suggest a positive and enduring impact of human occupation. My thesis research sits within a larger interdisciplinary

project, led by Elizabeth Graham (UCL), that is examining environmental history, characterisation of modern landscape and profiling of cultural deposits to investigate the anthropogenic input in soil and landscape formation. The Marco Gonzalez project includes field archaeology, archaeobotany (wood and non-wood), soil micromorphology, paleolimnology, soil science and botany to produce a perspective that examines a variety of human-environment impacts, at different scales, from ancient occupation through to its enduring effects in the present day. My own research seeks to combine these different datasets to produce a systemic assessment of ancient activities and their potential, relative environmental impact, as well as an analysis of the role of each dataset in defining long-term impact and change. I am specifically contributing archaeobotanical investigations to detail the non-wood black carbon in the soils; a likely significant contributor to soil fertility. I am also producing a material assessment of the archaeological deposits, towards the quantification of materials with the potential to influence the chemical and physical characteristics of sediments and soils. The paper will discuss the interdisciplinary approach being used at the site and detail the intended contribution of archaeobotanical and materials-based datasets in the examination of very long-term human impact, from ancient to modern. The results to date will be presented together with the plans for furthering the work.