



# Association *for* Environmental Archaeology

42<sup>nd</sup> Conference of the AEA:

The environmental archaeology of landscapes and land-use

2<sup>nd</sup>-4<sup>th</sup> December 2022, University of Glasgow

Hosted by:



University  
of Glasgow



Penn  
UNIVERSITY of PENNSYLVANIA

Organised by:

Prof Nicki Whitehouse, Dr Matthew J Jacobson, Dr Gareth Beale (Univ. Glasgow)

Dr Xiaolin Ren (Univ. Glasgow and Chinese Academy of Sciences)

Prof Kathy Morrison (Univ. Pennsylvania)

The Conference will be livestreamed here:

<https://echo360.org.uk/section/98206505-452f-4ce8-9e84-199878773e12/public>

## Programme

Friday 2<sup>nd</sup> December 2022,

Atrium, Wolfson Medical Building, University of Glasgow

16:00-18:00 Registration Opens.

Lecture Theatre 2, Boyd Orr Building, University of Glasgow

18:00-19:45 Welcome, Keynote and Evening Talks (Chair: Prof Nicki Whitehouse, University of Glasgow)

18:00-18:05 Welcome – Dr Kenny Brophy

18:05-18:45 Keynote Ingrid Mainland, UHI: *Where the sheep climb, and the cattle go: integrating landscape and livestock in Iron Age and Medieval Scotland.*

18:45-19:00 Gareth Beale, Univ of Glasgow: *Insula Obscura: Experiments in Autoethnographic film making and personal archaeologies of landscape on and around the Scottish West Coast.*

19:00-19:15 Lizzie Robertson, Univ of Glasgow: *Establishing a creative practice for collecting, composing, and performing Scottish Highland landscapes.*

19:15-19:30 Abbi Flint, Univ of Newcastle: *Poetic inquiry and landscape heritage research.*

19:30-19:45 Claudia Lubao, Univ of St. Andrews: *Communicating Environmental Archaeology Issues through Popular Music: The Act of Musicalizing Archaeology and Heritage for sustainability in Tanzania.*

Atrium, Wolfson Medical Building, University of Glasgow

19:50-21:00 Wine reception.

Saturday 3<sup>rd</sup> December 2022,

Lecture Theatre, Sir Charles Wilson Building, University of Glasgow

8:30 Registration in the Foyer of Sir Charles Wilson Building; building opens from 8:30.

9:00 – Welcome

**9:05- 11:00 Environmental Histories I (Chair: Dr Matt Jacobson, Univ of Glasgow)**

9:05-9:20 Claudia Sciuto et al. Univ of Pisa: *Forsaken ecologies on the mid-mountain. Exploring abandoned landscapes in the Apuan Alps (Tuscany, Italy)* .

9:20-9:35 Tim Mighall, Univ of Aberdeen, *Iberia Climate change and human activity drive vegetation change during the last eight millennia in the Xistral Mountains of NW Iberia.*

9:35-9:50 Ceren Kabukcu, Univ of Liverpool: *Inhabiting the woodland: characterising socialised landscapes in prehistoric Southwest Asia.*

9:50-10:05 Aroa García-Suárez et al., Spanish National Research Council (CSIC): *Çatalhöyük in context: a multi-proxy palaeoenvironmental study of a contemporary occupation at Pınarbaşı, Central Anatolia.*

10:05-10:20 Emilie Green, Univ of Aberdeen: *Chronology, Climate & Resilience: Using Multi-Proxy Bayesian Chronologies to Examine Pastoralist Responses to Dynamic Steppe Environments and Landscapes in Mongolia.*

10:20-10:35 Alex Brown et al., Wessex Archaeology: *The challenges of environmental archaeology on Oceanic Islands: environmental histories of human impact and the case study of Mauritius in the Indian Ocean.*

10:35-10:50 Irene Torregiani et al. Univ of Oxford: *The Pollen Atlas Project: reconstructing 1200 yr of climatic change through the creation of the first palynological atlas of Nicaragua.*

10:50 – 11:00 Questions, Discussion.

11:00-11:30 Tea/Coffee Break.

**11:30-13:00 Environmental Histories II (Chair: Dr Michael Given, Univ of Glasgow).**

11:30-11:45 Annabel Everard et al., Univ of Aberdeen: *People and Scotland's ancient woodlands: palaeoecological insights into woodland dynamics and their drivers.*

11:45-12:00 Rosie Bishop et al., Arkeologisk Museum, Universitetet i Stavanger: *Adaptation and changing land-use in Neolithic Scotland.*

12:00-12:15 Scott Timpany et al., UHI: *Forging Resources: an anthracological investigation of wood-fuel resources for Iron Age metalworking activity in Northern Scotland.*

12:15-12:30 Sophie Macdonald et al. SUERC, Univ of Glasgow: *Frontier environments: palaeoenvironmental reconstruction Beyond Walls.*

12:30-12:45 Samantha Jones et al., Univ of Aberdeen: *Exploring the 'Zombie narrative' of Iona via the environmental record: Can the integration of palynology with archaeological and historical evidence improve our understanding of the impacts of social change on societies?*

12:45-13:00 Questions, Discussion.

13:00-14:00 Lunch Break.

**14:00 – 15:40 Land Use Session I (Remote) with University of Pennsylvania (Chair: Prof Kathy Morrison, Univ of Pennsylvania)**

14:00-14:15 Jennifer Bates et al., Seoul National University, Korea: *Modelling land use and change from 12k to the present day - introducing the LandCover6k Korea Working Group.*

14:15-14:30 Chad Hill et al., Univ of Pennsylvania: *Early to Mid-Holocene Land Use Transitions in South Asia: a new archaeological synthesis of potential human impacts.*

14:30-14:45 Marco Madella et al., Univ of Pompeu Fabra, Barcelona: *Europe Land Use at 6000 BP.*

14:45-15:00 Alice Yao et al., University of Chicago: *Clarifying Land Use in China at 6kya: Archaeological Data and the Expansion of Farming.*

15:00-15:15 Amy Cromartie et al., Cornell University: *The socio-political drivers of agro-pastoral land-use and landscape fire in the Bronze and Iron Age South Caucasus.*

15:15-15:30 Shalini Sharma et al, Birbal Sahni Institute of Palaeosciences, Lucknow, India: *Agriculture and land-use pattern from an Indus settlement in north-western India: Implications to the past human-environment interactions.*

15:30-15:45 Arjun Rao, Central University of Karnataka, India: *Land Use and Landscape Modifications in the multi-period sites of Raichur Doab, South India.*

15:45-15:55 Discussion.

15:55-16:15 Tea/Coffee.

**16:15-17:40 Land Use session II (Chair: Dr Emma Jenkins, Bournemouth University)**

16:15- 16:30 David Findley et al., Max Planck Institute for Geoanthropology: *Mapping the 'Pantropocene': Establishing Template Land Use Models for the Philippine Archipelago, 1564-1898.*

16:30-16:45 Sarah Elliott, Bournemouth University: *The legacy of 1300 years of land use in Jamaica.*

16:45-17:00 Joe Hirst, Univ of Reading: *An Agent-based model of pre-Columbian land-use in the Monumental Mound Region of Amazonian Bolivia.*

17:00-17:15 Ben Pears et al, Univ of Southampton: *Tracing loessic sediments and a history of colluviation and land use across a chalkland lynchet system of eastern Belgium.*

17:15-17:30 Sam Hudson et al, Univ of Southampton: *Sedimentary Ancient DNA in Environmental Archaeology: Current Progress and Future Potential.*

17:30-17:40 Discussion.

17:45-18:45 AGM

19.00- Conference Dinner, Glasgow University Union.

Sunday 4<sup>th</sup> December 2022,

Lecture Theatre, Sir Charles Wilson Building, University of Glasgow

8:30 – Building opens.

9:00 – Welcome

**9:05-10:45 Landscapes and Places (Chair: Dr Kenny Brophy, Univ of Glasgow)**

9:05-9:20 Julia Cussans et al. UHI: *Human-landscape interactions at Skail Farm, Rousay: an integrated study of biological and historical data, a case study from the LIFTE project.*

9:20-9:35 Michael Given, Univ of Glasgow: *Places, partnerships and ecologies of care: landscape relations in Post-Medieval Greaulin, Trotternish, Skye.*

9:35-9:50 Michael Wallace et al. Headland Archaeology (UK) Ltd and MOLA-Headland Infrastructure (MHI): *Strategies and sustainability: the ebbs and flows of crop agriculture at sites along the River Great Ouse, Cambridgeshire, UK.*

9:50-10:05 Harry Manley, Bournemouth University: *Salt of the Earth: disentangling natural and anthropogenic landscapes in the Poole harbour catchment using deposit modelling.*

10:05-10:20 Dave Cowley, Historic Environment Scotland: *Place and people – modelling the palaeo-landscape of East Lothian, Scotland.*

10:20-10:35 Kenny Brophy et al, (Univ of Glasgow) *Awakening a sleeping giant: unwilding and rewilding a Neolithic cursus monument at Drumadoon, Arran.*

10:35-10:45 Questions, Discussion.

10:45-11:45 Tea/Coffee Break & Posters Session (see list of posters below).

**11:45- 13:00 Relationships with Landscapes and Species (Chair: Dr Gareth Beale, Univ of Glasgow)**

11:45-12:00 Phil Barratt et al., Univ of Nottingham: *Pathways to recovery: using archaeology and palaeoenvironmental data to address contemporary environmental challenges.*

12:00-12:15 Anwen Cooper, Tina Roushannafas et al., Oxford Archaeology: *'Rewilding' later prehistory: what can archaeological wildlife tell us about human-landscape relations now and*

*in the past?*

12:15-12:30 Barry Taylor, University of Chester: *Multispecies encounters in the British Mesolithic.*

12:30-12:45 Holly Young, UHI: *Feast, Famine or Fancy? Iron Age relationships to marine shellfish.*

12:45-13:00 Discussion.

13:00-14:00 Lunch.

#### **14:00-15:00 Relationships with Species (Chair: Gill Campbell, Historic England)**

14:00-14:15 Jen Harland, UHI: *Finding invisible whales: an environmental history of pilot whales and humans in the Northern Isles of Scotland.*

14:15-14:30 Michelle Feider and Emma Jenkins, Bournemouth University: *The Impact of the Anthropogenic Niche on Microfaunal Species Diversity in the Epi-Paleolithic and Neolithic of Anatolia.*

14:30-14:45 Paul Clarkson, Bournemouth University: *Tracking human activity through microfauna: the rise and fall of commensals in early Neolithic Ganj Dareh.*

14:45-15:00 Discussion.

15:00-15:20 Tea/Coffee.

#### **15:20-16:45 Wetland Landscapes (Chair: Dr Rachel Opitz, Univ of Glasgow)**

15:20-15:35 Elena Familietto et al., University of Utrecht: *Getting to the bottom of Lake IJsselmeer near Swifterbant: the changing landscape along Dutch creek systems during the Mesolithic/Neolithic transition.*

15:35-15:50 Sally Derett, Univ of Sheffield: *Life on a coastal floodplain: prehistoric human-environment interactions in the Lincolnshire Fenlands.*

15:50-16:05 Nicki Whitehouse et al. University of Glasgow: *'Where Land and Waters Meet'; 10,000 years of human eco-dynamics within a 'Wildscape'.*

16:05-16:20 Thya van den Berg et al. Univ of Hull: *Disentangling the local and regional effects of drainage on the Isle of Axholme using the Multiple Scenario Approach for pollen.*

16:20-16:35 Don Meara, Historic England: *Digging for Britain: the British landscape revolution since 1950.*

16:35-16:45 – Final Discussion and Close.



## Poster Display

Session on **Sunday, 10:45-11:45**, posters on display from Saturday.

In alphabetical order by first author surname:

Chen Antler, University of Glasgow: *Meaningful Places: Intertwined Identity and Environment in Archaic Rome.*

Laura Bailey, Headland Archaeology: *Woodland resource utilisation from the Bronze Age to the Saxon period in rural Cambridgeshire: the charcoal assemblage of the A14 project.*

Helen Basson, University of Sheffield: *How did the Second World War and subsequent events affect the historical landscape of the Norman Bocage? A case study - Operation Cobra, La Chapelle en Juger, France.*

Siglinde Burghouts: *The discrepancy of our modern state (and how to regain balance through archaeology).*

Gill Campbell, Historic England: *More than mundane weeds: an archaeological exploration of our changing relationship with arable weeds.*

Alice Duleba-Dowsett et al., University College London: *The Richborough Connection Project, Kent, UK: 13,000 Years of Natural and Human-Induced Landscape Change in the Wantsum Valley.*

E Green et al., BioArCh: *Creating land: Understanding the use of space on and around the crannog Moynagh Lough via the investigation of coprolites.*

Matthew J Jacobson et al., University of Glasgow: *Anthropogenic decline at the end of Antiquity? Land-Use and Land-Cover reconstructions for Lycia-Pamphylia.*

Faidra Katsi, University of Nottingham: *Chemotaxonomy: a new tool for discriminating between wild grasses and cereal pollen species?*

Nysa Loudon, University of Glasgow: *The ecology, materials, and aesthetics of unusual fibres in early textiles.*

Meriel McClatchie et al., University College Dublin: *Mapping underutilised crops in Ireland – past, present and future.*

Holley McCoy, Univ of Glasgow: *The impact of the kelp industry at Calbost, Isle of Lewis at the*

*end of the 18th Century: Robert Weir, a progressive and entrepreneurial tacksman.*

Greg Michaelson, University of Aberdeen: *"The Long Man will never wake!": British hill figures in Punch cartoons, 1925-1990.*

Luke Michno-Neville, University of Hull: *Living on the Edge: surviving and thriving in the Holocene Humberhead Levels.*

Christine Milton, Headland Archaeology: *A14-Producing vegetation models for public engagement.*

Martin Seijo et al., Universidad de Cantabria: *Landscapes of Craft in the Mariana Islands.*

Ed Treasure et al., Wessex Archaeology: *Heathland exploitation in later prehistory and the Romano-British period in Britain: a review of the evidence.*

Kate Turner et al., Headland Archaeology: *Building up the Breadbasket: agriculture and settlement in the A14 River Great Ouse landscape block.*

Alice Wolff, Cornell University: *Preliminary Archaeobotanical Results from the Medieval Capital of Northumbria.*

## Full Abstract List:

Friday 2<sup>nd</sup> December 2022

Keynote: Where the sheep climb, and the cattle go: integrating landscape and livestock in Iron Age and Medieval Scotland

Professor Ingrid Mainland, Archaeology Institute, University of the Highlands and Islands

### Abstract

For the animal species whose lives are entwined with ours, landscapes are often significant places of habitation and are locales where diverse human-animal encounters take place. For livestock species, the daily and seasonal rhythms associated with herding and livestock management transforms the wider environment through woodland clearance, enclosure and grazing intensity and shapes human interaction with the landscape reflecting the grazing or watering requirements of specific livestock species, their need for shelter or livestock management decisions affecting herd dynamics and production. Moreover, interaction with livestock forges connection across landscapes, physically in the form of tracks and routeways linking grazing or markets or the movement of dead and livestock between communities but also conceptually through grazing agreements, marriage dowries, etc. Taking Iron Age and medieval Scotland as a case study, this paper will explore how zooarchaeological evidence can contribute to our understanding of past landscapes of human-livestock interactions, addressing some of the limitations faced when using zooarchaeology in this way as well as the future potential of biomolecular approaches. Livestock impact through overgrazing and desertification is a major concern in many areas of the world today. The paper will conclude by considering whether archaeological studies of livestock management have any relevance for livestock managers today.

Insula Obscura: Experiments in Autoethnographic film making and personal archaeologies of landscape on and around the Scottish West Coast.

Dr Gareth Beale, University of Glasgow, [Gareth.Beale@glasgow.ac.uk](mailto:Gareth.Beale@glasgow.ac.uk)  
(co-author) Elizabeth Robertson

### Abstract

Film Screening with Live Presentation and accompanying installation

Archaeological image making has rarely received the same degree of theoretical attention that other areas of archaeological practice have enjoyed. Still and moving images have tended to be seen as ancillary to other forms of archaeological communication and the processes of interpretation, mediation and knowledge creation which characterise archaeological image

making have been under-examined. This presentation will explore a personal practice of archaeological film making as it has evolved over the past two years and will argue for a renewed focus on experimental making and creativity at the heart of archaeological practice.

*Insula Obscura* is an experimental film documenting the evolution of a personal relationship with an archaeological landscape. The idea for the film initially emerged during the 2020 Covid lockdown as an attempt to explore the overlap between an avocational interest in film making and my professional interest in digital methods of archaeological representation. I began to capture snippets of film documenting my encounters (mostly through lockdown family walks) with archaeology in the landscape around my home in a small town in West Scotland. Over time, these snippets coalesced into a longer piece which articulates a deepening awareness and knowledge of place, as encountered and inhabited in the course of family life.

Working in a new medium under these very unusual circumstances caused me to question many of the assumptions which had governed my relationship with archaeology and with archaeological practice. The project became an experiment in making archaeological media and an examination of the entangled and ever-changing relationships between archaeology, technology, landscape, and self.

Establishing a creative practice for collecting, composing, and performing Scottish Highland landscapes.

Lizzie Robertson, University of Glasgow, [2195922r@student.gla.ac.uk](mailto:2195922r@student.gla.ac.uk)

### **Abstract**

Perceptions and representations of Scottish Highland landscapes have often been subject to romantic notions of the sublime – with landscapes being perceived as empty, wild and rugged. Such perceptions have a tendency to overlook the archaeological past and present realities of highland life, where landscapes were busy with the activity of human and non-human actors and supported a rich tradition of Gaelic language and culture. Creative and innovative approaches to archaeological methodologies and interpretation have played an increasing role within the discipline, with interdisciplinary collaborations between archaeologists and artists paving the way for new spaces in which archaeology can be a creative process. Parallel to this, both new and old forms of immersive technologies present mediums through which to further explore creative forms of archaeological practice and interpretation. In this paper I will discuss my creative practice through field-recording in the landscape of Glencoe; re-collecting and recreating past soundscapes through archaeological, historical, and environmental records; composing pieces from and about Glencoe, and then, finally, performing these in the landscape itself. Through this practice, I hope to explore the ways in which creative audio experiences, experiments and acoustic reconstructions can engage audiences with the past in emotional, meaningful ways. These augmented and mixed reality experiences can show how such technology can enhance an audience's experience of

cultural heritage landscapes, and how immersive audio can play with the lack of visual presence versus sonic presence when it comes to interpreting and interacting with landscape. These contemporary digital interventions will promote more nuanced interpretations of highland life that, as mentioned above, have often been subject to romantic stereotypes and a memorialised past.

Poetic inquiry and landscape heritage research.

Dr Abbi Flint, School of History, Classics and Archaeology. Newcastle University,  
[Abbi.flint@newcastle.ac.uk](mailto:Abbi.flint@newcastle.ac.uk)

## Abstract

*Poets make the best topographers*  
-W.G. Hoskins

This session will explore the potential of poetic inquiry (Faulkner 2000) to foster creative ways of researching and thinking about human-landscape relationships and engagements. Poetry, landscape and archaeology have a long history of connections; from the Romantic poetry of John Clare, to Seamus Heaney's bog poems and contemporary poetic engagements with landscape and archaeology (e.g., Jo Bell's *Doggerland*). Whilst much has been written about the connections between poetry and cultural understandings and perceptions of landscape (e.g., Edwards 2017), there is rather less on poetry as a landscape research method.

Poetry's ability to hold and communicate the complex embodied, sensuous and affective aspects of being in the world (Giles 2000; Sansom 1994) is well suited to phenomenological explorations of dynamic human relationships with landscapes. It also holds potential, like fictive writing, as a way to capture wonder, empathy and ambiguity within archaeological interpretation (van Helden & Witcher 2020).

During this session, I will share and reflect on examples of how I have integrated poetic inquiry into my own practice, as a researcher within two landscape archaeology and history projects. Within these projects I researched perceptions of peatland cultural heritage (as part of *WetFutures*<sup>1</sup>) and how people have used and experienced paths and trails (as part of *In all our footsteps*<sup>2</sup>). I integrated poetic inquiry at different points in the research process, within an approach that draws on archival material, archaeology and folklore, and qualitative research interviews to explore plural experiences and perceptions of landscapes and their heritage.

*Stories, poetry,  
traces of lives in landscapes –  
we work with fragments*

## References

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<sup>1</sup> <http://www.wetfutures.eu/>

<sup>2</sup> <https://www.allourfootsteps.uk/>

- Edwards, J. (2017) 'The Land to Forget Time': tourism, caving and writing in the Derbyshire White Peak. *Landscape Research*, 42(6), 634-649  
<https://doi.org/10.1080/01426397.2017.1316836>
- Faulkner, S. (2020). *Poetic Inquiry: Craft, Method and Practice*. Routledge
- Giles, M. (2000). 'Open-weave, Close-knit' Archaeologies of Identity in the Later Prehistoric Landscape of East Yorkshire. [Doctoral Dissertation, University of Sheffield]. White Rose eTheses Online <https://etheses.whiterose.ac.uk/3526/>
- Sansom, P. (1994). *Writing Poems*. Bloodaxe Books.
- van Helden, D. & Witcher, R. (Eds) (2020). *Researching the Archaeological Past through Imagined Narratives*. Routledge.

Communicating Environmental Archaeology Issues through Popular Music: The Act of Musicalizing Archaeology and Heritage for sustainability in Tanzania.

Claudia Lubao, University of St. Andrews, [cbl1@st-andrews.ac.uk](mailto:cbl1@st-andrews.ac.uk)

**Abstract**

This paper will focus on popular music, specifically taking advantage of how the brain processes texts differently when it is set to melody and rhythm as a new strategy for communicating environmental archaeology, i.e., climate change impacts on heritage. I will share some fundamental and well documented insights from music psychology as to how the brain processes text and speech differently when it is set to music, and how as a result, information communicated through music can be remembered more easily and have a greater impact on the listener. The presentation will highlight a particular form of music, *Bongo Fleva* (the main style of popular music in Tanzania) and its use with respect to heritage both in Tanzania and more widely in East Africa.

The use of music in communicating environmental archaeology and heritage issues has resulted to great changes in managing archaeological and heritage sites in Tanzania. For instance, the song [Kilwa Yetu](#) which aims at protecting and preserving the Kilwa ruins world heritage site, brought widespread attention to the plight of the site that other methods of promotion could not have achieved by reaching audiences outside the reach of more traditional, academic avenues. A further video commissioned for UNESCO based on country-wide African heritage research, [Africa's Heritage](#), was launched at their headquarters in Paris in May 2018. This video gave the local community a voice to discuss their heritage, which has led to significant policy changes at a national level. Likewise, [Climate and Heritage](#) aims to raise issues about climate change, how they affect archaeology and heritage aspects and suggest the way forward to mitigate further damages.

Saturday 3<sup>rd</sup> December 2022

Forsaken ecologies on the mid-mountain. Exploring abandoned landscapes in the Apuan Alps (Tuscany, Italy).

Claudia Sciuto, MAPPA lab- Department of Civilizations and Forms of Knowledge, University of Pisa, Italy, [Claudia.sciuto@unipi.it](mailto:Claudia.sciuto@unipi.it)

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### **Abstract**

During the last 80 years, the slopes of the Apuan Alps looking towards the Tyrrhenian Sea have been marked by an extensive process of abandonment.

For centuries, and until WWII, the mountains had been populated by human communities practicing agriculture, pastoralism, quarrying, and mining. These centuries-long traditions have contributed to creating a situated network of humans and more-than-human, deeply intertwined within the landscape. The shifting economic paradigm after the war has caused the depopulation of these areas. The mountain slopes that bear the traces of subsistence activities are now undergoing deep transformations, where animals and plants are occupying the space where humans once dwelled.

For a few years, our research team has been exploring those places of resurgence (Tzing, 2017), examining the co-occurrence of material traces of past lives and the multispecies responses to the abandonment of pastures, forests, cultivated areas, and quarries.

We have adopted a multiscale and transdisciplinary approach. By reconstructing diachronic human occupation based on legacy data and implementing the information in a GIS environment. Land use and other information on vegetation are inferred from historical maps while field surveys have been carried out to map new evidence of everyday life in the mountains.

Finally, ethnographic work in collaboration with local communities is aimed at collecting memories linked to the landscape, to redefine the geography of multi-species narratives. Our case study focuses on the analysis of transformations that have happened in the last decades and that are still ongoing, as environmental archaeology of the recent past and the present, and on the continuous renegotiations of the relations between human communities and the environment, which can provide indications for envisaging future sustainable developments.

Tsing, Anna Lowenhaupt. 2017. 'A Threat to Holocene Resurgence Is a Threat to Livability'. In *The Anthropology of Sustainability*, 51–65. Springer.

Climate change and human activity drive vegetation change during the last eight millennia in the Xistral Mountains of NW Iberia.

T.M. Mighall, Univ of Aberdeen

**Abstract**

An 8500-year record of high-resolution pollen, non-pollen palynomorph, microscopic charcoal and selected geochemical data (Ti, Zr and Pb) are presented from an ombrotrophic mire from the Serra do Xistral, Galicia, North-West Iberia. The results suggest that vegetation changes over the last eight millennia are primarily the result of human disturbance, fire and climate change. Climate and fire were the main factors influencing vegetation development during the early to mid-Holocene, including a short-lived decline in forest cover c. 8.2 ka. Changes associated with the '4.2 and 2.8 cal. BP events' are less well defined. Human impact on vegetation became more pronounced by the late Holocene with major periods of forest disturbance from c. 3100 cal BP onwards: during the Metal Ages, Roman period and culminating in the permanent decline of deciduous forests in the post-Roman period, as agriculture and metallurgy intensified, leading to the creation of a cultural landscape. Climate change became less significant as no major changes in vegetation coincide with the Roman Warm Period, Medieval Climatic Anomaly or the Little Ice Age.

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Inhabiting the woodland: characterising socialised landscapes in prehistoric Southwest Asia

Ceren Kabukcu, University of Liverpool, [C.Kabukcu@liverpool.ac.uk](mailto:C.Kabukcu@liverpool.ac.uk)

**Abstract**

In this talk, I will present the results of recent archaeobotanical research from the Eastern Fertile Crescent tracing long-term trends and the development of plant subsistence practices through the Upper Palaeolithic, Epipalaeolithic and early aceramic. My aim will be to reframe the evidence for wild plant food and woodland vegetation use with a view to examining the development and expansion of socialised landscapes. I will focus on case studies from sites along the Taurus and northern Zagros Mountain foothills, presenting new data and synthesising existing archaeobotanical evidence to propose ways in which we can trace the development of anthropogenic vegetation types and how these relate to the sustainability and endurance of human occupation in the region. I argue that in the Eastern Fertile Crescent, the available archaeobotanical evidence points to the persistent use and exploitation of select vegetation habitats and regionally idiosyncratic plant food staples. These anthropogenic landscapes formed the backbone of resilient hunter-gatherer communities in the region through multiple episodes of climatic fluctuations and shifts in subsistence economies.



Çatalhöyük in context: a multi-proxy palaeoenvironmental study of a contemporary occupation at Pınarbaşı, Central Anatolia.

García-Suárez, Aroa<sup>1,2\*</sup>; Baird, Douglas<sup>3</sup>; Portillo, Marta<sup>1</sup>; Bull, Ian D.<sup>4</sup>; Koromila, Georgia<sup>2</sup>; Matthews, Wendy<sup>2</sup>

1 Spanish National Research Council (CSIC), Milà i Fontanals Institute (IMF)

2 University of Reading, Department of Archaeology

3 University of Liverpool, Department of Archaeology, Classics and Egyptology

4 University of Bristol, Department of Chemistry

\* corresponding author e-mail: [a.garcia-suarez@imf.csic.es](mailto:a.garcia-suarez@imf.csic.es)

**Abstract**

The ‘mega-site’ of Çatalhöyük (Konya province, Türkiye), covering an area of *ca.* 13 ha, is amongst the largest known in the Near Eastern Neolithic. The site has long been interpreted as a stand-alone settlement resulting from the agglutination of all the population in this region, thought to be devoid of other contemporary settlements. The pastoral rockshelter of Pınarbaşı (Karaman province, Türkiye), located 24.5 km to the southeast of Çatalhöyük and radiocarbon-dated to *ca.* 6500–6000 cal BC – therefore contemporaneous with the Ceramic Neolithic levels at Çatalhöyük – challenges this view and provides an opportunity to place this large community in a broader geographical and cultural context.

This paper presents the results of the macro- and micro-stratigraphic, geoarchaeological and palaeoenvironmental analysis of the Pınarbaşı occupation. Microscopic examinations of occupation sequences and their components are essential to the characterisation of archaeological sediments and the identification of site formation processes and karstic syn/post-depositional processes affecting deposits in rockshelters. The application of these high-resolution techniques to investigate micro-contextual traces of behaviour within the sequence, closer to seasonal and life-cycle changes such as periodic site abandonments, have contributed to the identification of resources and activities, adding further information to the socio-cultural connection of the Pınarbaşı population with that at the larger site of Çatalhöyük, and to its ecological interests in the wider landscape.

Chronology, Climate & Resilience: Using Multi-Proxy Bayesian Chronologies to Examine Pastoralist Responses to Dynamic Steppe Environments and Landscapes in Mongolia.

Emilie Jean Green, University of Aberdeen and Queen’s University Belfast,  
[e.green2.20@abdn.ac.uk](mailto:e.green2.20@abdn.ac.uk)

**Abstract**

This paper presents a novel approach for the examination of chronology alongside paleoclimatic proxies for specific localities, helping to bridge gaps in Mongolian paleoclimatic records, and focusing on understanding climatic and environmental change from the ‘smaller picture’ up. Presented here will be an extensive suite of new and published radiocarbon dates

alongside stable isotope data for C/N, O, S isotopes from human and animal remains excavated from burial contexts across the Egiin Gol to construct a robust Bayesian chronology for north Mongolia that supplements current chronological frameworks, corroborates emerging narratives of increasing cultural complexity across Eurasian Prehistory and demonstrably questions traditional narratives of homogeneity. This multi-faceted study explores the application of stable isotopes as proxies for paleoclimate (alongside diet and foddering practices) and explores how nomadic pastoral communities adapted to the dynamic and changing environments of Eastern Eurasia during the Middle Holocene, and the Bronze and Iron Ages. This will enable a better understanding of the environments and climates of Eurasian landscapes, whilst contributing to Pan-Asian narratives of human adaptation and resilience throughout the Holocene.

The challenges of environmental archaeology on Oceanic Islands: environmental histories of human impact and the case study of Mauritius in the Indian Ocean.

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**Abstract**

Small islands, with clearly defined physical boundaries and finite natural resources, are particularly sensitive to human exploitation. Recent human colonisation of remote island environments has typically resulted in the dramatic modification of their ecosystems. The arrival of humans is typically followed by deforestation, the introduction of non-native plants and animals, agricultural expansion, and economic exploitation, resulting in sustained environmental degradation and a significant loss in indigenous vegetation cover and biodiversity.

Today, less than 2% of native forest cover remains on Mauritius and the island has become an important case study on the environmental impact of European colonial expansion and industrialisation. Consequently, Mauritius has one of the most vulnerable island floras and faunas in the world and recent initiatives have sought to protect, conserve, and restore the biodiversity of both terrestrial and maritime environments.

Thus far, environmental archaeology has had a comparatively limited contribution to debate on future conservation policy but nonetheless should play integral role by providing a long-term perspective on the human ecology of Mauritius.

This paper provides an overview of existing evidence for human impact on Mauritius and avenues for future research, including environmental history, palaeoecology, geoarchaeology and zooarchaeology. We consider the role that this data can play in a broader understanding

and appreciation of biocultural and natural heritage of Mauritius, its promotion for economic purposes, including the blue economy, and contribution to the debate on conservation and biodiversity.

The Pollen Atlas Project: reconstructing 1200 yr of climatic change through the creation of the first palynological atlas of Nicaragua.

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### **Abstract**

The Pollen Atlas Project (PAP) was founded in 2018 with the goal of creating the first comparative palynological atlas for the Dry Tropical Forest (DTF) of Central-Western Nicaragua. One of the many uses of this atlas is to aid in the identification of fossil pollen from lacustrine sediment records (e.g. the 1,200 year extracted from El Tigre-Asososca lake, León). The PAP aims to understand the effects of climate change and anthropogenic activity on other DTF by combining botanical surveys, fresh pollen collections, pollen traps and paleoenvironmental reconstruction. The pollen atlas is freely available on the open-source platform the *Global Pollen Project* (<https://globalpollenproject.org/>) and provides information on local uses, ecology, taxonomy, and pollen morphology for 202 species. This presentation will explore the interdisciplinary approach that led to the creation of the PAP, alongside practical applications, and new discoveries. Specific attention will be given to the pollen taxa identified in the palaeoecological record of El Tigre-Asososca lake providing new insights into paleoclimatic changes and prehispanic anthropic activity in Central-Western Nicaragua.

People and Scotland's ancient woodlands: palaeoecological insights into woodland dynamics and their drivers.

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Dr Scott Timpany, Archaeology Institute, University of Highlands and Islands,  
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## Abstract

This paper presents new palaeoecological data regarding the long-term vegetation history of 'ancient' oak woodlands in Scotland. Rather than focusing upon landscape-scale changes, we consider compositional and structural dynamics at the stand scale using peat samples taken from 'forest hollows'. We focus on woodlands that have persisted since the first available written woodland records (i.e. extant prior to 1750 CE), and thus have been retained within landscapes undergoing substantial change. Ancient woodlands often have high conservation value due to their associated biodiversity, and are considered our closest example of 'natural' woodland ecosystems. We present key findings from sites designated for conservation in Aberdeenshire and Stirlingshire. These north-east and central Scotland sites are a sub-set of an east to west transect of sites across Scotland, with work focused on west coast Atlantic oakwood still ongoing.

The application of both pollen and plant macrofossil analyses to investigations of forest hollows is something that has rarely been attempted, and seemingly not yet within Scottish woodland contexts. Our approach facilitates the reconstruction of highly localised records of vegetation change and allows us to focus on sub-canopy layers, in addition to canopy-forming trees. Robust chronologies are provided by radiocarbon ( $^{14}\text{C}$ ) dating. By extending vegetation records beyond those that can be directly observed by ecologists and land managers through long-term plot based woodland monitoring, we ensure we capture changes over multiple generations of long-lived dominant trees, revealing potential shifts in environmental baselines. We consider the role of human activities in shaping these woodlands. Coprophilous fungi are utilised as indicators of herbivory, and local to regional scale fire activity is assessed via macro and microscopic charcoal analyses. Our data suggests human activities can be agents of woodland change and survival, with incidental or purposeful woodland manipulation potentially having long-term implications.

## Adaptation and changing land-use in Neolithic Scotland.

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## Abstract

The environment of Scotland presented a diverse and relatively challenging environment for the establishment of early agriculture and was one of the last areas of Europe to which agriculture spread. Scotland therefore provides a useful case-study area for examining early agricultural land-use strategies. After the introduction of agriculture at the beginning of the 4<sup>th</sup> millennium cal BC, the Neolithic economy of Scotland has been characterised by some as stable and well-adapted, despite the relatively marginal conditions for agriculture and evidence for late Neolithic climate deterioration. On the other hand, the later Neolithic has also been portrayed by some as a time of instability, with some arguing for agricultural and population collapse coupled with climate change. The evidence for differences within and between regions with regards to land-use at this time, as well as for temporal change in agricultural practices also highlights potential interactions between local short-term human decisions and the impact of longer-term climate change. This paper will consider the evidence for different agricultural land-use strategies in Neolithic Scotland using an extensive archaeobotanical synthesis from across Scotland, together with new crop stable isotope evidence from several major cereal assemblages.

Forging Resources: an anthracological investigation of wood-fuel resources for Iron Age metalworking activity in Northern Scotland.

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**Abstract**

This paper takes an anthracological approach to the investigation of two Iron Age metalworking sites in Northern Scotland, Culduthel, Invernesshire and The Cairns, Orkney. The study focuses on wood-fuel to look at what impact these communities had on woodland through analysing charcoal fragments from contexts directly associated with metalworking. Culduthel was home to a community of skilled artisan metalworkers who produced a range of high-quality metal objects some of which were likely to have been traded with Roman communities. Radiocarbon dates from Culduthel show a community was present here from around 810-550 cal BC to cal AD 130-340 and lived in impressive roundhouses with monumental architecture demonstrating their wealth, whilst working in specialised workshops found to contain in-situ furnaces with fills of iron slag and charcoal. The Cairns represents a different type of Iron Age community who undertook smaller-scale metalworking activity within a broch village setting, largely for the production of personal objects such as brooches and pins around cal AD 240-390. The results of the anthracological analysis inform on the range of trees resourced for wood-fuel at the two sites and demonstrate that rather than unsustainable felling of woodland these resources were likely to have been managed and protected, particularly in areas such as Orkney where woodland would have been sparse. The results offer a different perspective of the relationship between Iron Age communities in the North of Scotland to woodland and how

woodland itself was a vital commodity to metalworking activities. In the absence of pollen evidence, the charcoal identifications provide the first records for Iron Age woodland at both locations.

### Frontier environments: palaeoenvironmental reconstruction *Beyond Walls*

Sophie McDonald (presenter, University of Glasgow).

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### **Abstract**

The Leverhulme-funded *Beyond Walls* project aims to explore the impact of Roman occupation in Northern Britain through analysis of settlement and land-use in the area between and around Hadrian's Wall and the Antonine Wall. *Beyond Walls* is looking at trends and changes over the long-term – c.500 BC-AD 500 – in a study area extending from northern England to the southernmost part of the Scottish Highlands. The project is adopting a multi-scalar, interdisciplinary approach, reviewing published survey and excavation data and grey literature; incorporating remote-sensing data; producing new radiocarbon dates from excavated sites and collating and producing palaeoenvironmental datasets (see Fernández-Götz, 2022).

Palaeoenvironmental techniques can and have been used to explore questions regarding agricultural activity in colonial (e.g. Allen & Lodwick, 2017) and frontier (e.g. Dumayne-Peaty, 1999) contexts. It is hoped that the interdisciplinary, multi-scalar approach of this project will produce nuanced accounts of encounters between Roman military and Iron Age populations, avoiding foregrounding imperial perspectives. This presentation will outline the progress and initial results of *Beyond Walls*, discussing existing settlement and palaeoenvironmental evidence from the study area and the project's outcomes thus far.

Allen, M. and Lodwick, L., 2017. Agricultural strategies in Roman Britain. In :

Allen, M., Lodwick, L., Brindle, T., Fulford, M. and Smith, A. (eds.) *New visions of the countryside of Roman Britain volume 2: the rural economy of Roman Britain*. Britannia Monograph Series, 30. Society for the Promotion of Roman Studies: London, pp.142-77.

Dumayne-Peaty, L., 1999. Continuity or discontinuity? Vegetation change in the Hadrianic–Antonine frontier zone of northern Britain at the end of the Roman occupation. *Journal of biogeography*, 26(3), pp.643-665.

Fernández-Götz, M., Cowley, D., Hamilton, D., Hardwick, I., & McDonald, S., 2022. Beyond Walls: Reassessing Iron Age and Roman Encounters in Northern Britain. *Antiquity*, 96(388), pp.1021-1029.

Exploring the 'Zombie narrative' of Iona via the environmental record: Can the integration of palynology with archaeological and historical evidence improve our understanding of the impacts of social change on societies?

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### **Abstract**

The island of Iona, situated off the west coast of Scotland, is renowned for formerly being an early Christian power centre. The monastery was founded in AD 563 by St. Columba and was responsible for the spread of Gaelic Christianity throughout Scotland, northern England and beyond. It became a renowned centre for learning, great art works were produced on the island and kings were buried here; it is also the place where the earliest surviving law in Scotland was written (by Adomnán - the law of the innocents), 1<sup>st</sup> recorded in the *Annals of Ulster* in AD 697. However, between AD 796-825 the monastic community were subjected to a series of violent raids over a 30-year period by the Vikings. These raids would have had a devastating impact on the monastic community. Recent archaeological work, however, has demonstrated that the 'zombie narrative' (Viking-induced downfall of Iona) is not as straightforward as once thought. Here we will present the palynological findings from Iona. Taking the strengths and weaknesses of our results into consideration our main aim is to explore whether and how this environmental record might be integrated with the archaeological findings and historical texts to improve our understanding of the social changes impacting the landscape of Iona between the 7<sup>th</sup>-16<sup>th</sup> centuries AD.

Modelling land use and change from 12k to the present day - introducing the LandCover6k Korea Working Group

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## Abstract

Human societies have managed and modified Earth's landscapes for thousands of years, altering global patterns of biodiversity, ecosystem functioning, and climate. However anthropogenic modifications and land use accelerated with the emergence of agriculture. This pace of change will only accelerate further with the land changes to come under the 4th Industrial Era. The extent, trajectory, and implications of these changes are still not fully understood, and the implications of our long term history for future climate change predictions need more research. The newly formed LC6k Korean Working Group (KWG) is building on current research on global past land use to deliver data-driven models of anthropogenic changes in landscape and environment in the Korean Peninsula for climate change prediction modelling. This region is of particular importance to understanding the impacts of human societies on past climates, environments and change for example through the role of the introduction of rice agriculture and its implications for the Anthropocene debate. In this paper we introduce the KWG and outline how the history of research into land use and change in the region has developed over time, and how this will be brought together through the LC6k methodology to model change for climate predictions, with a focus on the discussions around data availability and the impact of these debates on our Anthropocene futures in the rapidly changing Korean Peninsula.

## Early to Mid-Holocene Land Use Transitions in South Asia: a new archaeological synthesis of potential human impacts

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<sup>6</sup> Various affiliations

## Abstract



While it is clear that current human impact on the earth system is unprecedented in scope and scale much less is known about the long-term histories of human land use and their effects on vegetation, carbon cycling, and other factors relevant to climate change. Current debates over the possible importance of human activities prior to the last few hundred years cannot be effectively resolved without evidence-based reconstructions of past land use and its consequences. In this paper, we present the first large-scale synthesis of archaeological evidence for human land use in South Asia at 12 and 6kya, a critical period for the transition to agriculture, arguably one of the land use transitions most consequential in terms of human impact on the Earth system. South Asia has an extremely long history of human occupation, and is currently home to more than one billion people, making it a critical location for understanding the long-term histories and consequences of human land use. This first-ever synthesis of archaeological data on land use for South Asia highlights the deep history of both human land use and variation in land use practices, even prior to farming. While the latter may help elucidate the multiple transitions to farming in South Asia, data on the former are critical for assessing the potential environmental impacts of human activity on a subcontinental scale. We highlight both the mosaic nature of early agriculture and the long-term persistence of hunting and gathering, differing from accounts which begin with the oldest example of agriculture in South Asia (which falls between these two time slices, as discussed below) and trace the history of farming as a singular narrative.

#### Europe Land Use at 6000 BP

Marco Madella<sup>1</sup>, Nicki Whitehouse<sup>2</sup>, Marc Vander Linden<sup>3</sup>, Chad Hill<sup>4</sup> Kathy Morrison<sup>4</sup>, Jennifer Bates<sup>5</sup> and the Europe Working Group\*

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\*The Europe Working Group work represents the efforts of many scholars, not all of whom are listed here for reasons of space; a full list of Europe participants is here:

<https://landuse.sas.upenn.edu>.

#### **Abstract**

The PAGES LandCover6K group is concerned with prehistoric human impacts on land cover and whether these impacts were sufficiently large to have affected regional climates. This is usually done via modelling land cover using different scenarios. However, there are major differences

between the current available land use scenarios, between these scenarios, and reconstructions based on pollen analysis. A promising way to achieve a more realistic assessment of the land use changes needed to affect past climate is to input land use models with more accurate land cover and land use changes inferred directly from both palaeo-vegetation (land cover) and archaeological records (land use).

We present a top-level land use map for Europe at 6000 cal BP and summarise key land use activities for selected regions, derived primarily from radiocarbon dates, compared with site-based distribution maps and records of animals and plants used by people as proxies for the past economy, alongside contextual data. By 6000 cal BP large areas of Europe were already subjected to major land use change, although the intensity of land usage at this time varied significantly between regions, likely the consequence of both gaps in archaeological knowledge and differences in land use practice (e.g. the degree of reliance on agriculture, if any) and population dynamics. Incorporating this variability in land use intensity produces a considerable improvement in existing land-use scenarios produced by modelled data (e.g. HYDE) and improves understanding of how past land use may have impacted past climates.

#### Clarifying Land Use in China at 6kya: Archaeological Data and the Expansion of Farming

Alice Yao, Jennifer Feng, Austin "Chad" Hill, Kathleen D. Morrison, Jennifer Bates, Marco Madella, Nicola Whitehouse

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#### **Abstract**

Current debates surrounding the “Early Anthropocene Hypothesis” revolve around understanding the impact of preindustrial agriculture on the global carbon cycle and climate during the middle Holocene optimum from 9-5kya. The relevance and significance of Neolithic farming in China to the Early Anthropocene hypothesis is, however, unclear. Current ALCC scenarios vary widely in their estimates for the timing and geographic extent of preindustrial farming’s impact on land cover change in the region. To address these differences, it is critical to develop a more robust picture of land use patterns and baseline projections for China beginning in the middle Holocene. Using direct, well-established archaeological datasets, this paper presents a reconstruction of land use at 6000 +/- 500 BP, using the typology developed by the PAGES LandCover6k project, to help improve and reconcile the differences among ALCC scenarios.

The socio-political drivers of agro-pastoral land-use and landscape fire in the Bronze and Iron Age South Caucasus.

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## **Abstract**

This paper investigates how the different social and political structures in Bronze and Iron Age Armenia shaped the surrounding steppe landscape through their agro-pastoral practices. We utilized a series of sediment cores from an altitudinal transect from around Mount Aragats, Armenia in conjunction with multiple biological and geochemical proxies (pollen, non-pollen palynomorphs, XRF, brGDGTs) to untangle landscape usage from other environmental drivers. We also build on the published archaeological investigations from the Armenian-American archaeological project, Project Aragats.

In this paper we focus on the pollen and macro-charcoal results from two sediment cores. One higher in the foothills, published in Cromartie et al. (2020), and a new record located in the valley. We find the markers of human activity corresponds with Early Bronze Age Kura-Araxes expansion of cereal agriculture into this highland region. This is followed by a decline in these markers in the Middle Bronze Age when there is a shift away from permanent settlements and increases in mobile pastoralism. Human indicators of agro-pastoralism land-use return as communities return to practice settled agriculture from the Late Bronze Age through the Iron Age. Human landscape usage is primarily isolated to the core site in the valley through most of the record, but this changes during the Iron Age when shifts in political structure may have driven communities to utilize wetlands higher in altitude. Macro-charcoal analysis across all cores records a similar fire history which appears to be driven by climate until the last 2000 years but shifts in vegetation in the previous periods suggests humans contributed to the fire regime. Overall, our records show that even within a small geographical area, human communities may have different landscape usage and that the social and political structures can influence this impact.

Cromartie, Amy, et al. "The vegetation, climate, and fire history of a mountain steppe: A Holocene reconstruction from the South Caucasus, Shenkani, Armenia." *Quaternary Science Reviews* 246 (2020): 106485.

## Agriculture and land-use pattern from an Indus settlement in north-western India: Implications to the past human-environment interactions

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Agriculture has a major role in influencing landscapes, soils and subsistence since its inception. Though agriculture is a human effort but, it has intimate link(s) with contemporary environment. Fossilised organic remains (charred seeds/grains) recovered from archaeological excavations reveal wealthy information about past agricultural practices and contemporary environment. Macro-botanical along with stable carbon isotope analysis at an archaeological site 4MSR (29°12'24.48"N, 73°09'20.16"E; western Rajasthan) spanned time bracket from early Indus (~2900-2600 BCE) to the mature Indus phase (~2600-1800 BCE) revealed how agricultural practices at this settlement shifted from wetter to drier (arid) conditions with an agricultural adaptation during end of the mature phase and plausibly lead to the abandonment of the site. Scientific analyses revealed the cropping strategies and agro-hydrological pattern at this settlement. All together the data revealed that the agriculture during early phase mainly rely on winter season crops facilitated with the winter precipitation, however the mature phase revealed diversification and intensification of crops owing to the strengthening of India Summer Monsoon (ISM). Occurrence of drought resistant millets and  $\delta^{13}\text{C}$  of grains and soil organic matter revealed transformation of agricultural practices during aridity at the end of mature phase after ~2100 BCE. Abundance of millets might have played an important role as an adaptations to the deteriorated climatic conditions due to prolonged weakening of ISM. Overall subsistence pattern indicates continuity and change in temporal domain likely owing to changing environmental conditions over time ~2900–1800 BCE. The cultural adaptation enables consideration of issues related to adoption and resilience in the face of changing economic and environmental conditions. We surmise that the adverse climatic conditions (declining monsoon) might have compelled settlers to opt for alternative crops resilient to prolonged drought conditions. Present study provides a valuable template for modern societies in exploring plausible strategies to tackle future climate change.

## Land Use and Landscape Modifications in the multi-period sites of Raichur Doab, South India

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### **Abstract**

Deccan Plateau (south India) is a semi-arid region of denudational and hilly terrain formations with a fertile alluvial on the riverine basins of Krishna and Tungabhadra (forming Raichur Doab). The early prehistoric cultures, such as the Palaeolithic and Mesolithic sites, are distributed on

the riverbanks and flood plains. In contrast, a makeshift in the landscape preferences is evident in the Neolithic (3000-1200BCE) and Iron Age (1200-300 BCE) periods, as their settlements were centred in the hills, away from the river basins. Many of the sites in this region are multi-period sites spanning from Neolithic, Iron Age and Early History (300 BCE-500CE). These sites have exhibited transitional changes in land use and settlement patterns and stand testifies to landscape and local resource potentialities in sustaining more than three cultural periods. Current research on a regional scale at Raichur Doab has identified shifts in Mesolithic sites, generally located in riverine valleys for the availability of cryptocrystalline gravels, eventually moved towards the denudational terrains and low elevated hill environs accessible with natural rock shelters and natural springs. New landscapes explored by the Mesolithic foragers became full-fledged sedentary Neolithic villages during the 3rd- 2nd millennium BCE. Iron Age inhabitants continued to depend on the Neolithic villages by adapting new land use strategies for mortuary practices, intensive economic operations, and water management, leading to new geo-political dynamics. Field reconnaissance with geospatial analyses on multi-period sites has indicated transitions in the functional characteristics of agro-pastoral economy and a mixed economy. Settlement expansions perhaps were forced by increasing population and intensive food production with changing technologies from stone to metal. The reuse of lithic materials, the continuation of rock art practices with new forms of content, and the increasing use of rock shelters and resource locations leading to the development of social and political centres are discussed.

### Mapping the 'Pantropocene': Establishing Template Land Use Models for the Philippine Archipelago, 1564-1898

Presenter, First Author: David Max Findley

Senior Author: Patrick Roberts

Co-Authors: Grace Barretto-Tesoro, Greg Bankoff

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### **Abstract**

Tropical forests play a critical role in the operation of an array of earth systems, being closely integrated into the biosphere, hydrosphere, and atmosphere. Consequently, deforestation and changes in land use in the tropics can have major regional and global feedbacks in the 21<sup>st</sup> century, making tropical forests a key part of the 'Anthropocene' – or the epoch in which humans have come to dominate earth systems. Given growing evidence for long-term human interactions with these environments, the question remains as to whether pre-industrial

human impacts on tropical forests could have led to similar downstream earth systems consequences.

Of particular interest is the potential impact of European colonialism on tropical forests, especially how introduced systems of land administration, crops, animals, and extractive approaches affected forest cover and human-environment relations. The Philippine Islands, which sat at the heart of the first truly global economic exchange system within the Spanish Empire, represent a compelling case study to explore the effects of colonial introductions on tropical forest cover. The PANTROPOCENE project seeks to model the extent, nature, and consequences of changing human land use in the Philippines from 1564 (just prior to the Spanish establishing a colony in the archipelago) until 1898 (the end of the Spanish period).

Here, we present the “template” land use categories and the associated models the project will use to model historic Philippine land use. The templates are designed to reflect the environmental and politico-cultural diversity of Philippine societies in this period, and rely on multidisciplinary data from archival documents, ethnohistorical accounts, archaeological fieldwork, palaeoecological research, and anthropological reports. We discuss the complexities of this approach to land use modelling in the Philippine Archipelago and its potential to study human-forest-earth systems interactions more widely in the tropics across space and time.

### The legacy of 1300 years of land use in Jamaica

Sarah Elliott<sup>a</sup> (Presenter)

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### **Abstract**

Despite decades of archaeological research on Jamaica, little is known about how settlers influenced landscape change on the island over time. Here, we examine the impact of human

occupation through a multi-proxy approach using phytolith, charcoal, and stratigraphic analyses. White Marl was a continuously inhabited village settlement (ca. 1050–450 cal yrs BP) with large mounded midden areas, precolonial house structures, and human landscape management practices. We have shown that the local vegetation at White Marl was directly affected by human settlement through the use of agroforestry and burning, and suggest that fire was used to modify vegetation. Manioc phytoliths were found throughout human occupation and are broadly associated with increases in evidence for burning, suggesting fire was used to modify the landscape and clear vegetation for crop cultivation. The phytolith assemblages relate to three distinct temporal vegetation phases: (1) the earliest occupation dominated by arboreal vegetation (pre-ca. 870 cal yrs BP); (2) a transition to palm-dominated vegetation (ca. 870–670 cal yrs BP); and (3) the latest occupation representing European colonization associated with a more open, grass-dominated landscape (after ca. 670 cal yrs BP). These transitions occur independent of changes in paleoclimate records, suggesting humans were the dominant driver of vegetation change.

### An Agent-based model of pre-Columbian land-use in the Monumental Mound Region of Amazonian Bolivia

**Presenter:** Joe Hirst<sup>1</sup>

**Co-authors:** Joy Singarayer<sup>2</sup>, Francis Mayle<sup>1</sup>

<sup>1</sup>Department of Archaeology, Geography and Environmental Science, University of Reading, UK

<sup>2</sup>Department of Meteorology, University of Reading, UK

#### **Abstract**

For decades, the extent to which pre-Columbian (pre-1492 AD) societies were able to modify Amazonian environments has been heavily debated. Some of the strongest evidence for landscape domestication comes from the Monumental Mound Region of the rainforest-savanna mosaic (Llanos de Moxos) of Amazonian Bolivia. Between 400 – 1400 AD, pre-Columbian people undertook landscape engineering in this region to produce >150 large habitation mounds, interconnected by a complex network of causeways, canals, and lakes. However, little is known about how this Monumental Mound Culture (MMC) utilised and modified the surrounding rainforest and savanna ecosystems, as well as the population size that could be supported. Although traditional palaeoecological techniques (e.g., fossil pollen analyses) can provide important insights into past human activity, only a modelling approach can attempt to quantify the scale of human land-use (e.g., deforestation, arboriculture, maize cultivation), estimates of population size, and processes underlying human-environment interactions on the landscape.

Here, we present an exploratory Agent-based model which we developed to generate hypotheses regarding the nature and extent of pre-Columbian land-use within the

Monumental Mound Region. This model primarily focuses upon the extent and spatial distribution of anthropogenically altered land under multiple population and land-use scenarios, such as altering the size of human populations and enabling/disabling the cultivation of open savanna. To do this, the model produces a representation of the pre-Columbian Monumental Mound Region within a virtual landscape, parameterised using archaeological, ecological, ethnographic, and topographic data. Agent-based simulation approaches are ideal for exploring such human-environment interactions because system characteristics (e.g., population, landscape modification) are treated as the products of human behaviour operating at the individual scale. As such, model outputs can be compared to empirical observations to improve our understanding of the processes underlying the system. These outputs can also act as a foundation to guide future palaeoecological and archaeological research.

### Tracing loessic sediments and a history of colluviation and land use across a chalkland lynchet system of eastern Belgium.

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### **Abstract**

Readily identifiable and distinctive loess (windblown) deposits cover large areas of central mainland Europe including Belgium. In many cases these sediments have been mapped across chalkland landscapes and due to their particular textural and mineralogical characteristics (well drained and fertile) have been intensively cultivated in the past. This has led to major tillage-driven colluviation and sediment storage within terrace and lynchet



features. This paper presents detailed geoarchaeological results from a substantial chalkland lynchet system at Sint Marten-Voeren in the Limburg Province of eastern Belgium. Analysis of both *in situ* and reworked loess from a hillside transect using a range of analytical techniques particularly pXRF, alongside a detailed Optically Stimulated Luminescence (OSL) chronology have enabled a robust chronostratigraphy to be determined from hilltop to valley bottom. Results from the research has shown that the elemental signature of loess at the sample site can be traced through the assessment transect and has illustrated a complex history of cultivation and colluviation from the Iron Age to present day, with particularly extensive sediment transfer in the early medieval and medieval periods associated with a major expansion of agriculture including hop cultivation.

### Sedimentary Ancient DNA in Environmental Archaeology: Current Progress and Future Potential

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#### **Abstract**

The extraction and analysis of sedimentary ancient DNA (*sedaDNA*) is revolutionising palaeoecology and Quaternary science. It is also making an increasing contribution to environmental archaeology from both off-site and on-site contexts. This paper will show how its use has progressed from archaeological sites in the Arctic to the temperate regions, and from lakes to wetland sediments and soils. To understand the context of DNA deposition, it has to be evaluated against other environmental data most specifically lithostratigraphy, dating frameworks and pedological processes. We also argue that *sedaDNA* is complimentary to traditional environmental techniques such as plant macrofossils, pollen, spores and insects. This paper will illustrate current progress using lake, wetland and soil archaeological contexts from sites ranging in age from Mesolithic to the Medieval periods. The critical questions of both extrinsic and intrinsic ‘authentication’ of *sedaDNA* will also be highlighted. The ability of *sedaDNA* to produce data on past plants and animals (and even eukaryotic pathogens) is a potential step-change in environmental archaeology.

Sunday 4<sup>th</sup> December 2022

Human-landscape interactions at Skaill Farm, Rousay: an integrated study of biological and historical data, a case study from the LIFTE project

Julia E M Cussans (presenter), Jen Harland, Ingrid Mainland, Sarah Jane Gibbon, Owen Brady and Dan Lee

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### **Abstract**

The LIFTE (Looking in from the Edge) project examines post-medieval trade between Orkney and Shetland and continental Europe. Two of the major export goods from Orkney were butter and grain, both of which were collected through the taxation system of skat payments, while Shetland tended to export butter alongside a variety of fish products, while importing grain. Early taxes in the medieval period were largely based on butter, but following an enquiry in 1490, a change in the taxation system allowed part of the tax to be paid in grain and other goods. Successive rental agreements survive in written form from the late 15<sup>th</sup> century onwards, and provide access to quantities of in-kind rents, including grains, butter, poultry, oil, fish, etc. This paper examines both these rentals and published archaeological sources from the Northern Isles to look for changes in dairy and grain production in association with this change in taxation. It seems likely that such a change would have had a significant effect on human land use, with a shift in emphasis from pastoral to more mixed farming. Was this seen throughout Orkney, or were there more nuanced changes on the different islands and between different parishes/districts? How does this compare with what was happening in Shetland at the time? Ongoing excavations at Skaill Farm on Rousay, Orkney provides fresh environmental and dating evidence from this period that can be compared with detailed historic rental data for the farm, giving a unique insight into food production and land use at that time. In the later post-medieval period dramatic landscape changes took place at and around Skaill Farm, caused by the Rousay clearances. These changes are well documented historically, including on estate maps; we will discuss how these changes affected the biological data from the final phases of our excavations.

Places, partnerships and ecologies of care: landscape relations in Post-Medieval Greaulin, Trotternish, Skye

Michael Given

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## Abstract

How can we characterise, interpret and communicate complex landscapes such as the post-Medieval agricultural township of Greaulin in North-East Skye? A dot on the map, a species list, a soil classification, lines on a plan showing enclosures, kailyards and houses? These barely begin to embrace the web of relations between the many partners whose interactions make Greaulin a distinctive and striking place: geology, soil, topography, weather, crops, flowers, livestock, wild animals, farmers, herders, children, landowners, and many more.

The complexity of such a landscape arises from the very specific roles and interactions that each of these partners has with the other. Plants and animals select particular ecological niches, which are themselves affected by nutrient and water cycling by plants, grazing choices by livestock, and human interventions into soils and water. Fields, meadows and gardens, then, are a joint product of livestock, flora, soil, weather and people. A landscape such as Greaulin is an ongoing emergence of a long and continuing history of care, choices, work and attention, crossing boundaries of species, structures and materials.

This paper integrates a range of archaeological, historical and environmental data to explore ecologies of care at Greaulin, and tries to develop some creative approaches to communicating them when we are at a distance from the landscape itself.

## Strategies and sustainability: the ebbs and flows of crop agriculture at sites along the River Great Ouse, Cambridgeshire, UK

Presenter: Michael Wallace (1)

Co-authors: Lara Gonzalez Carretero (2), Kathryn Turner (1), Laura Bailey (1), Kath Hunter Dowse (1), Rachel Fosberry (3), Sarah Wyles (4), Emma Aitkin (4), Kate Roberts (2), Christine Milton (1)

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## Abstract

Archaeological works as part of the A14 Improvement Scheme (Cambridge to Huntingdon), funded by National Highways, has produced insights into the story of rural Cambridgeshire on a huge scale. The archaeobotanical assemblage alone involved the assessment of 9176

samples, 906 of which were taken to full analysis by a team of nine archaeobotanists. This talk weaves together the archaeobotanical evidence from the scheme's eight 'landscape blocks', with input from the archaeozoological, palynological, entomological, geoarchaeological and stable isotope studies. In many regards crop agriculture across the scheme – dating primarily to the Iron Age, Roman and Saxon periods – conforms to regional expectations. Delving deeper, however, this large dataset reveals stories of changing systems of productions, as well as shifts in the strategies of producers and consumer towards crop product and by-product. The A14's unified dataset coupled with the expertise of multiple specialists affords us the opportunity to explore the changing role of agriculture, including how it shaped and was shaped by the local environment.

### Salt of the earth: disentangling natural and anthropogenic landscapes in the Poole Harbour catchment using deposit modelling

Harry Manley

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Bournemouth University; [hmanley@bournemouth.ac.uk](mailto:hmanley@bournemouth.ac.uk)

#### **Abstract**

Poole Harbour and its wider catchment is internationally renowned for its natural beauty and biodiversity. Land to the north and east of the harbour form the urban areas of Poole and Bournemouth while the southern and western sides are regarded as undeveloped natural landscapes, consisting of heath, marsh and forested land. Such is the capital placed on this natural landscape that in 2021, over 3,000 hectares was designated as a 'super' National Nature Reserve (NNR). Operationally, the NNR has the overarching aim to restore 'natural' processes across the landscape making it more resilient to climate change and other pressures, yet the fundamental character of the Poole harbour catchment is arguably the product of millennia of human interaction and modification.

In order to assess the impact of past human activities on modern landscapes, deposit modelling using geochemical and magnetic susceptibility analysis was undertaken at the site of Wytch Farm, Dorset. This project excavated a large-scale industrial complex that included salt production and metal working evidence. The programme of deposit modelling explored the wider landscape impact of these processes, mapping their extent and intensity, identifying a heavily modified, anthropogenically influenced landscape.

The natural character of the Poole Harbour catchment, as visible today, is therefore the result of complex relationship between past coastal communities and natural resources. This study shows that the extent of the impact of human activity is often greater than the focal points of activities themselves and highlights the value of mid-scale landscape studies.

## Place and people – modelling the palaeo-landscape of East Lothian, Scotland

Dr Dave Cowley

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### **Abstract**

This paper presents an exploration of palaeo-landscape and settlement patterning of East Lothian in SE Scotland focussing on the late Iron Age and the mid-18<sup>th</sup> century AD. The study area lacks traditional palaeo-environment information (other than for sea-level change). Thus, the approach taken attempts to model the landscape before the major changes of the 'improvements' in the 18<sup>th</sup> century AD, principally in extensive drainage and canalisation of water courses. The approach combines modelling of flow, pooling and aspects of slope from modern digital terrain models to recreate a hypothetical pre-improvement landscape heavily dissected by watercourses and areas of poorly drained ground. Without underplaying the significant landscape change in preceding periods, the mid-18<sup>th</sup> and early 19<sup>th</sup> century AD changes in landscape were of a scale out of all proportion to anything that had gone before, so it is argued that the earlier 18<sup>th</sup> century landscape had much in common with earlier periods. This modelling is combined with the outcomes of an analysis of Iron Age settlement, which suggests a broad bi-partite division of the landscape into settlement and non-settlement areas. In assessing factors that may condition this patterning, the most compelling relationships are between areas of settlement and generally better drained areas, while ground characterised as damper (which is often generally flatter), or heavily dissected by water courses, are less favoured. This broad division of the landscape appears to have applied in the Neolithic and still found faint expressions in the mid-18<sup>th</sup> century settlement landscape, speaking of a long-term relationship between a population and its landscape built on an abiding sense of the structure of the landscape which recognised from an early date that some areas were better suited for habitation than others. This broad model provides a framework within which to consider the disposition of people in the landscape.

### Awakening a sleeping giant: unwilding and rewilding a Neolithic cursus monument at Drumadoon, Arran

Kenny Brophy et al, (Univ of Glasgow)

Since 2021 the Awakening Sleeping Giants Project has been working in partnership with Drumadoon Estate to undertake a series of small-scale archaeological interventions in and around a putative Neolithic cursus monument, an enormous earthwork site consisting of two banks some 40m apart and running for 1.1km across the moor. This monument appears to be entangled in a rich prehistoric farming landscape, beneath and above the banks, and within and respecting the cursus notably in the form of roundhouses, field banks and clearance cairns in and around the cursus. The creation of the cursus and practice of farming in the Neolithic and EBA represented an extended and radical series of acts transformation of the

environment here. In the process of studying these acts of unwilding, the archaeological and environmental evidence is feeding into future rewilding strategy of the landowner. This paper will report on results of excavation and environmental sampling to date, and explore how this project might contribute to conversations about the future of farming and land-use on this island, and beyond.

Pathways to recovery: using archaeology and palaeoenvironmental data to address contemporary environmental challenges.

Phil Barratt (presenter), Hannah O'Regan (CA), Annegret Larsen (CA), Matthew Dennis (CA)

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### **Abstract**

How do we best integrate palaeo-data to address questions of modern significance such as woodland expansion or rewilding? Our UKRI-funded CASTOR project is exploring pathways for the recovery of riparian treescapes to improve outcomes for climate, environment and communities. An interdisciplinary team including artists, modellers and archaeologists are working together to resolve some of the challenges involved. Archaeological evidence from case-study locations in Cumbria and West Yorkshire is an integral part of the research design, providing context for current and future landscape management pathways. A programme of archaeological and palaeoenvironmental data collation and analysis is underway to create past landcover scenarios and determine the presence of landscape engineers in these study areas. These findings will feed into hydrological modelling and inform VR models for community engagement. This paper will present the approaches taken and preliminary results from archaeological and palaeoenvironmental work carried out. It will also outline some of the challenges of integrating the past into a contemporary landscape regeneration project.

Project website: <https://castorprojectdotcodotuk.wordpress.com/>

'Rewilding' later prehistory: what can archaeological wildlife tell us about human-landscape relations now and in the past?

Anwen Cooper, Tina Roushannafas, Polydora Baker, Gill Campbell, Ruth Pelling, Fay Worley

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## Abstract

The *'Rewilding' later prehistory* project seeks to put archaeological 'wildlife' centre-stage in reimagining human-landscape relations in Britain from c. 2500 BC to AD 43. Rebalancing previous emphases on the *claiming* of landscapes for farming and settlement, the project will look at how interaction with the landscape is *negotiated* in accordance with not only the habits and rhythms of domesticated plants and animals, but also those of 'wild' species – from bees to bears to beech trees. In certain contexts, the agency of 'wild' species extended beyond human control – devastating crops, reclaiming previously cleared land, threatening herd and human lives. Elsewhere, 'wildlife' was managed to an extent that poses questions about how prehistoric people defined 'the wild'. Drawing on biological remains – mainly plant macrofossils and vertebrates – with an emphasis on collating data recovered in developer-funded settings, this project aims to:

- (a) Bring together previously isolated strands of research about deep-time wildlife
- (b) Create a methodological and interpretative 'toolkit' for approaching archaeological wildlife
- (c) Explore how holistic accounts of human ecologies in later prehistory – a key tipping point in the transition from 'wild' to 'farmed' landscapes in Britain – can inform current nature recovery practices

Key to these academic aims is project leadership grounded in the paleoenvironmental expertise at Oxford Archaeology, in collaboration with colleagues at the Universities of Oxford, Exeter and Toulouse, Historic England and Knepp Rewilding hub. Together with digital experts at the Archaeology Data Service, we will take practical steps towards building a FAIRer future for environmental archaeological remains. In this vein, we present the initial results of a cross-sector survey of plant and animal remains specialists, which characterises the existing evidence base and future research aspirations of key practitioners. By addressing the current landscape we hope to stimulate an emerging era of industry-led 'biofuelled' research.

## Multispecies encounters in the British Mesolithic

Barry Taylor

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## Abstract

Multispecies approaches offer an important new perspective for the study of past environments and the role that humans played in structuring them. Developed initially in anthropology and the environmental humanities, the approach foregrounds the agency of non-humans, their capacity to create and change worlds, and the ways in which human lives are entangled within them. In doing so, it moves away from a focus on humans as the primary agents of change, and shows how environments form through the complex relationships between humans and an array of non-human beings.

This paper adopts a multispecies approach in assessing the role that humans played in structuring the environment during the British Mesolithic. Focusing in particular on the effects of humans on vegetation, it will show how the composition and character of plant communities was created, maintained, and changed through on-going interactions between human and non-human beings. It will argue that, by taking such an approach, humans can be shown to have played a far greater role in structuring their environment during the Mesolithic than is often assumed. It will also suggest that this has implications for contemporary conservation practice.

### Feast, Famine or Fancy? Iron Age relationships to marine shellfish.

Holly Young, University of the Highlands and Islands, [12000634@uhi.ac.uk](mailto:12000634@uhi.ac.uk)

#### **Abstract**

There is an assumption in Iron Age archaeology that shellfish consumption automatically indicates a societal state of famine and poverty, however this is far from the reality. This is not to say that shellfish were not relied upon in times of hardship, but that the role they played in society as a whole is far more convoluted. Shell assemblages are often disregarded after an initial conclusion of 'famine food', but there is much more that these shells can tell us.

To illustrate this, the marine shellfish assemblages from two Orcadian Iron Age sites have been examined. The Cairns, South Ronaldsay, is a substantial broch settlement with evidence of specialised craftworking and extensive feasting deposits. There is no evidence of a sustained period of famine or any sign of poverty throughout the long life of the site.

In contrast, Berst Ness, Westray, is characterised by marginal struggles. Skeletal analysis from associated burials shows evidence of seasonal deprivation, and high levels of infant mortality indicates a much harsher lifestyle than that experienced at The Cairns.

Both sites are coastal, both have the same range of taxa present, and both have substantial assemblages of marine shell which are being examined using traditional archaeozoological techniques. This presentation will demonstrate that 'traditional' analytical methods can reveal a complex and rich relationship between Iron Age communities and shellfish, going far beyond poverty resources and even beyond a food source, regardless of the economic quality of life at these sites.

### Finding invisible whales: an environmental history of pilot whales and humans in the Northern Isles of Scotland

Jen Harland

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## Abstract

Pilot whale hunts were an important part of life in the Northern Isles of Scotland, and this paper aims to trace the archaeological and historical evidence for the use of these animals over the last millennium. These hunts were opportunistic, and prior to the early modern period people made full use of meat, blubber and bone. But in recent centuries these hunts were all about the blubber and oil, processed locally for use as lighting, and the flesh was discarded. An early 19<sup>th</sup> century whaling pit from Sanday, Orkney, dug into a Neolithic settlement at Cata Sand, provides an archaeological route into this study. At this site, the headless bodies of a dozen or so whales were found, and tentatively matched with a hunt in July 1819 that was fortuitously documented by a passing antiquary and an irate local clergyman. Archival research reveals that these hunts have tended to be well documented, in part because where there are whales, there are arguments over rights to access the spoils. Here, both archaeological and historical data inform on quantities of animals taken over the years, and the implications this has for the environmental history of the species in Orkney and Shetland. Searches through newspaper archives reveal the surprising extent of these hunts in the 18<sup>th</sup> and 19<sup>th</sup> centuries, akin to the ongoing Faroese *grindadráp*. However, early 20<sup>th</sup> century photographs document the change from seeing these animals as 'monsters' to seeing them as a species to be saved, and even lamented. Now, a century on from the last hunts, how do population numbers compare with the quantities found in historic records, and can we start to establish historical baseline data?

## The Impact of the Anthropogenic Niche on Microfaunal Species Diversity in the Epi-Paleolithic and Neolithic of Anatolia

Michelle Feider and Emma Jenkins

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Emma Jenkins, Institute for Modelling Socio-Environmental Transitions, Bournemouth University, Poole, BH12 5BB.

## Abstract

The creation of the anthropogenic niche had a profound impact on biodiversity. Debates are on-going as to precisely when this began with many under-estimating the impact that humans had on the environment in prehistory. This phenomenon is explored through the analysis of three microfaunal assemblages that span the transition from mobile hunter-gathering to sedentary farming in Anatolia. The sites studied were: Pınarbaşı, a transitory rock-shelter site (14150-11000 cal. BCE), with a settled early Neolithic settlement (9800-7800 cal. BCE), and a transitory late Neolithic phase (6500-6000 cal. BCE); Boncuklu Höyük, a small early Neolithic village (c8300-7800 cal. BCE); and Çatalhöyük, a large proto-urban settlement (c7100-5950 cal. BCE). Results showed that the greatest species diversity was found in the earliest phase of occupation at Pınarbaşı where the seasonal and ephemeral nature of the human occupation had minimal effect on microfaunal species diversity. This is in stark

contrast to the early Neolithic sedentary settlement at Pınarbaşı, in which species diversity was much lower. A gradual shift was apparent in the Boncuklu Höyük assemblage with the first and earliest known occurrence of the house mouse (*Mus musculus domesticus*) in Anatolia, and large numbers of anurans, some of which would have been attracted to the site by the insects found in the middening areas. Finally, at Çatalhöyük, house mice dominated the assemblage, almost to the exclusion of all other species, because they were able to adapt and take advantage of the anthropogenic niche leading to a significant decrease in microfaunal species diversity in the environs of the settlement.

### Tracking human activity through microfauna: the rise and fall of commensals in early Neolithic Ganj Dareh

Paul Clarkson<sup>1</sup>, Katerina Papayianni<sup>2</sup>, Sabrina Renaud<sup>3</sup>, Heather Tamminen<sup>4</sup>, Emma Jenkins<sup>5</sup>, Thomas Cucchi<sup>6</sup>, Emilie Hardouin<sup>7</sup>

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#### **Abstract**

Hesse (1979) proposed that a rise in proportion of commensal *Mus* in the second occupation level at Ganj Dareh marked the beginning of all-year settlement, coinciding with the appearance of mud-built structures. He commented on the decline of other non-commensal microvertebrates. Analysis of microfauna recovered from excavations in 2017-2018 suggests a different interpretation. There was no gradual rise in the proportion of commensals compared to other species. *Mus musculus*, and smaller numbers of *Crocidura suaveolens*, were recovered from all levels, and non-commensal species were almost entirely absent. This was not a gradual replacement but an immediate takeover by species that must have been onsite previously. Specimens recovered from the site over time suggest a commensal population affected significantly by natural events such as earthquakes and predators, and by human decisions, like changes in building density and occupation activities. These events may

have affected on-site species distribution. The life of this settlement is reflected in microfauna recovered from the site.

Getting to the bottom of Lake IJsselmeer near Swifterbant: the changing landscape along Dutch creek systems during the Mesolithic/Neolithic transition

Elena Familetto<sup>1</sup>, Ana Smuk<sup>2</sup>, Kim Cohen<sup>1</sup>, Wim Hoek<sup>1</sup>, Lucy Kubiak-Martens<sup>3</sup>, Marco Madella<sup>4</sup>, Mans Schepers<sup>5</sup>, Esther Stouthamer<sup>1</sup>, Hans Huisman<sup>2</sup>

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## **Abstract**

One of the world's largest land reclamation projects, the Dutch province of Flevoland, revealed Mesolithic and Early Neolithic sites that provided environmental and archaeological information about the changing subsistence of their inhabitants –associated with the Swifterbant culture (c. 6000-4000 BCE) –including evidence of early crop cultivation on levees.

The Finding Suitable Grounds project (2022-2026; including PhD research projects of Familetto and Smuk) further addresses human-subsistence-related activities in this wetland environment and evaluates its suitability for cultivation by shifting our focus below the present-day Lake IJsselmeer to creek systems outside the reclaimed polder. Using cores from these submerged fluvial systems (banks, basins, and channel fill), this multi-proxy research combines <sup>14</sup>C dating, soil micromorphology, geochemical analyses, and several botanical proxies to describe the evolving landscape setting and identify early human land-use. The character of contemporary river bank soils, indications of disturbance (clearance, burning, tillage), and vegetation reconstruction with attention to crop indicators during and following the active period of the river system are key in identifying cultivation suitability and interpreting the interplay between natural and cultural phenomena.

Building upon decades of research, this multi-proxy dataset reaches beyond the reclaimed land to provide new highly detailed insight into the broader landscape setting of the Swifterbant population and their activities in this low-lying wetland region.

## Life on a coastal floodplain: prehistoric human-environment interactions in the Lincolnshire Fenlands

Sally Derrett

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### **Abstract**

The Fenlands of eastern England represent a unique landscape forged through a combination of natural and anthropogenic processes. The low relief of the area in association with sea-level rise throughout the Holocene resulted in an area prone to fluctuating episodes of marine and freshwater inundation, producing a temporally and spatially diverse and species rich landscape abundant in natural resources. In this research, the human relationship with the dynamic landscape of the Lincolnshire Fenlands throughout the Holocene is assessed through palaeoenvironmental analysis of a geographically diverse range of study sites. Foraminifera analysis shows multiple episodes of marine inundation and regression which affected areas far inland from the current coastline. Periods of sea-level change are reflected in the pollen assemblage which shows significant temporal and spatial variation in the vegetation history of the area, including phases of grassland, woodland, alder carr, peat bog, reedswamp and saltmarsh development. The pollen and microcharcoal analyses also indicate distinct episodes of woodland recession which can be associated with human clearance, and periods of pastoral agricultural land use signified by the increased presence of ruderal species. Signals of human land-use change in the palaeoenvironmental record are infrequent during periods of marine inundation though not absent, indicating a complex relationship with the landscape.

### ‘Where Land and Waters Meet’; 10,000 years of human eco-dynamics within a ‘Wildscape’

Nicki J. Whitehouse<sup>1</sup>, Henry Chapman<sup>2</sup>, Ben Gearey<sup>3</sup>, Kim Davies<sup>4</sup>, M. Jane Bunting<sup>5</sup>, Michelle Farrell<sup>6</sup>, Phil Barratt<sup>1, 7</sup> and Nika Shilobod<sup>8</sup>

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8 School of Geography, Earth and Environmental Sciences, Plymouth University, Drake Circus, Plymouth, PL4 8AA, England, UK.

## Abstract

Archaeological records indicate that humans have long been attracted to resources available within river and wetland ecosystems, with settlement and economic activities occurring around the wetland-dryland interface. Moving waters connect these places, weaving the threads of the landscape together, and impacting lifeways well beyond their boundaries.

Here, we explore changing wetland-dryland human eco-dynamics, across inter-connected river-mere-wetlands, to understand how these places were used and transformed over time. Our case study is the Humberhead Levels landscape, eastern England, where there has been a long history of palaeoenvironmental and archaeological study. Today the land cover is mostly intensive agriculture, with a few protected areas centred on the remnants of heavily exploited lowland ombrotrophic mires, surrounded by the rivers and former meres of the Torne, Idle, Don, Went and Trent. Historical maps, accounts, Lidar imagery and the sediments underlying the fields tell a different story; it was a landscape of inter-connected rivers, meres, wetlands and marshes, with extensive areas of open water, sometimes tidal, always deeply connected by sea and freshwater, with human settlement and activity clustered on islands of higher ground. The rivers and wetlands were extensively utilized over prehistory for their resources and as routeways, whilst in the Roman and historic periods were transformed for navigation, diverted, drained and canalized, representing a way of life and living-with-water that can be traced back through thousands of years, which survived until the 17<sup>th</sup> century. What was it like to live in these wild waterscapes, which were often different to adjacent drylands and yet always connected?

An extensive archaeological database has enabled us to infer the nature and focus of human activity and land use – from the Palaeolithic to the post-Medieval period - whilst pollen records have allowed us to reconstruct the land cover history of key archaeological periods, highlighting the differing ways in which these riverscapes and wetlands were used over time. By reconstructing the temporal palaeogeography and dynamics of the wildscape of this region it is possible to understand the complex patterns of human activity and land use change within these wetlands, demonstrating the importance of this region for resources and its wider connectivity, whilst at the same time emphasising continuity and the long-term nature of many human-environment relationships over time.

[Disentangling the local and regional effects of drainage on the Isle of Axholme using the Multiple Scenario Approach for pollen.](#)

**Presenter:** Thya W.B. van den Berg, Msc.

**Co-authors:** Dr M. Jane Bunting, Dr Graham Ferrier, Prof Daniel R. Parsons

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## **Abstract**

The Isle of Axholme is a low rise in the landscape of Western Lincolnshire and Southern Yorkshire, historically bounded by the rivers and winter-inundated wetland. Its slight elevation resulted in a culture, landscape and land use that were historically distinct from the surroundings, including a dominant pastoral agriculture. However, large parts of the neighbouring wetlands were drained in 1626-1629 by Dutch engineer Cornelius Vermuyden, with the intention of making the area more suitable for cereal production, which was considered more profitable. Historical documents indicate that the intended shift from pastoral- to arable-dominant agriculture indeed took place, however these sources are biased towards traded crops, and generally ignore cultivation for personal use as well as natural vegetation. In order to provide a nature-based view, a pollen record was produced from a moat on the Isle of Axholme, spanning approximately 80 years around the drainage works. Traditional pollen analysis resulted in two likely interpretations, but these cannot be disentangled without considering the movement of pollen and spatial context. We therefore apply the Multiple Scenario Approach to pollen modelling, in order to simulate the historical landscape, and provide a quantitative indication for which scenario fits best with the pollen record.

## Digging for Britain: the British landscape revolution since 1950

Don O'Meara

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## **Abstract**

When we consider the key periods of agricultural expansion and landscape modification in Britain, the period from 1950 is not often thought as a period of agricultural revolution. However, it was in the period that Britain achieved self-sufficiency in many agricultural products it had been importing since the later 18<sup>th</sup> century. This was driven by a political desire to make Britain self-sufficient, the use of scientific developments in soil modification, plant breeding, and new machinery.

The effect of this was wholesale reclamation of many thousands of acres of previously marginal land, and the push of intensive forms of agriculture into areas which had previously been regarded as marginal. The impact of this was both cultural and environmental. In the former case it altered the public consciousness about what "traditional" farming looked like on the landscape, exemplified by the current Prime Minister Liz Truss saying in her leadership campaign "I am committed to food production in this country and it makes my heart sink to see row upon row of solar panels where once there was a field of wheat or grassland for livestock to graze." From an environmental perspective it pushed agriculture into areas of fenland and upland where blanket peat and organic rich fenland deposits had previously retained carbon. Now, in the 21<sup>st</sup> century plans for mass forestation as a means of

combatting climate change are planned in a way which may profoundly impact on upland archaeological landscapes.

The purpose of this paper is to highlight the history of land reclamation in 20<sup>th</sup> century Britain using the literature on the topic produced for farmers, and political manifestos on the changing political focus of agriculture. The paper will highlight some of the issues facing current landscapes, and where an environment archaeology outlook is needed to inform and guide policy decisions.

## Poster Display

Session on **Sunday, 10:45-11:45**, posters on display from Saturday.

### Meaningful Places: Intertwined Identity and Environment in Archaic Rome

Chen Antler

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#### **Abstract**

The first millennium BC marked the beginning of major efforts invested by Iron-Age pre-Roman community to transform the natural environment in the area that would later become the center of a new city. This research seeks to explore the deep interconnectedness between humans and environment during this time, by investigating how the Romans built a collective sense of identity around their modification of natural features resulting in the creation of a new anthropogenic landscape embedded with social meaning.

This project employs a highly multidisciplinary approach, analyzing archaeological, palaeoecological, geoarchaeological and historical data through a theoretical framework of historical ecologies to evaluate the complexity of human-environment relationship in Rome in the *longue durée*. It includes several test-cases of landscape modification, including terracing hill-slopes and modifying the Tiber river basin, which became crucial in the creation of a Roman identity.

Firstly, this research estimates the opportunities and challenges presented by the environment and evaluates how the first settlers utilized and managed them. Secondly, it examines how narratives were constructed around these activities to give them meaning. Subsequently, it asks how human-environment relationships in Rome have been maintained for decades through changing circumstances as the anthropogenic landscape and the corresponding narratives were continuously maintained.

Beyond providing a clearer understanding on how the complex human-environment relationship played out during the first millennium BC in Rome, this research makes a case for reframing the environment as an active agent in the formation of human identity and makes critical contributions to current debates on how collective identities were formed in the past and how they are maintained today. As we make important decisions around our collective future heritage, we should regard the preservation of our natural environment as a crucial pillar in maintaining our identities in the world.



Woodland resource utilisation from the Bronze Age to the Saxon period in rural Cambridgeshire: the charcoal assemblage of the A14 project

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**Abstract**

The charcoal assemblage from the mitigation of the A14 Improvement Scheme is vast and includes over two thousand charcoal fragments from over 200 samples taken to full analysis. This dataset provides an invaluable insight into the utilisation of woodland resources in rural Cambridgeshire, spanning prehistory and historic periods. The charcoal assemblage indicates evidence for woodland management at some sites throughout the periods. Oak remained a highly utilised resource and appears to have been managed such that it is largely hidden from the palynological assemblage. The relationship between people and woodland resources is further explored through patterns in the selection of wood for cremation (n=71) and kiln firing. Both the cultural and utilitarian reasons behind wood resource preferences are explored.

How did the Second World War and subsequent events affect the historical landscape of the Norman Bocage? A case study - Operation Cobra, La Chapelle en Juger, France

Helen Basson

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**Abstract**

The Norman bocage is a constructed landscape that has archaeological and historical value as a manmade artefact, but constant evolution makes it difficult to assess this value. This paper aims to quantify the reciprocal relationship of the landscape itself and the events of Operation Cobra (July/August 1944) by examining the effects of the bocage on the military campaign and the subsequent physical and political changes made during and post the Second World War. La Chapelle-en-Juger was the worst hit village in the bocage area during Operation Cobra and has been selected as a case study for this reason, the changes in hedgerow density and orchard land-use changes are recorded and compared with the neighbouring commune of St Ebremond that was outside the main target area. Results show that the a) policy of 'remembrement' had a greater long-term effect on the bocage landscape than the war and b) that this policy has had a detrimental effect on the ecological, social and historic landscape.

## The discrepancy of our modern state, (and how to regain balance through archeology)

Siglinde Burghouts

Siglinde Burghouts, environmental archeology, anthropology, [siglindeburghouts@gmail.com](mailto:siglindeburghouts@gmail.com)

### **Abstract**

Through ethnoarcheological and anthropological examples of the Inuit in Northern Canada, the speaker will address, firstly, the difference in the way traditional Inuit lived differently with their environment, and the difficulties they faced in their sudden transition from a hunter-gatherer lifestyle to a sedentary modern way of life, in which social problems, violence, crime and drug abuse suddenly dominated. This can be seen as an extreme example of our own state, with recurring issues of maladaptation (diseases of affluence), as part of our current modern life, alienated from the natural world, but having still built-in evolutionary remnants of a different way of life.

Archeology can be seen as a means to remember a more balanced and interwoven state with nature. As a means to regain knowledge of (how to achieve) this balanced relationship with the natural cycles of raw materials and subsistence within the ecosystem (especially in parts of the world where indigenous peoples are not available as a source of information). This information can be of practical use to tackle our modern problems, consisting of the consequences of pollution (climate change), improving our relationship with the environment again, and making the natural cycles of raw material procurement, use and discard, smaller and more locally sustainable.

## More than mundane weeds: an archaeological exploration of our changing relationship with arable weeds

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In the UK there is a growing enthusiasm amongst gardeners and conservationists for growing annual wildflower mixtures in gardens, parks and nature reserves to increase biodiversity. These wildflower mixtures normally contain typical arable weeds, including common poppy (*Papaver rhoeas*) corn marigold (*Chrysanthemum segetum*), corn camomile (*Anthemis arvenis*), cornflower (*Centaurea cyanus*) and corn cockle (*Agrostemma githago*). At the same

time some rare arable weeds have been the focus of concerted conservation efforts aimed at saving threatened species from extinction by the adoption or continuation of sympathetic farming methods and the reintroduction of the target species to new sites (<https://naturebftb.co.uk/projects/colour-in-the-margins/>).

Although these modern day users of arable weeds and ecosystem engineers recognise the arable fields are a human construct, their understanding of the ecological history of a particular species and the arable landscapes they inhabit is poor to non-existent with plants often described as native when they are in fact archaeophytes or even neophytes. In addition, when choosing which arable plants to include in a mixture aesthetics clearly play an important role, which is not tacitly acknowledged. Neither is the exclusion of some species, either on practical grounds or due to undesirable traits, articulated.

This paper will explore our complicated relationship with arable weeds focussing on three species: common poppy -a native, corn marigold -an archaeophyte and pheasant's eye (*Adonis annua*) -a likely neophyte. Where did these plants originate, where did they travel to and where are they found now? What do they mean to us ,how are they contributing to newly created landscapes and what might the future hold?

#### The Richborough Connection Project, Kent, UK: 13,000 Years of Natural and Human-Induced Landscape Change in the Wantsum Valley

Alice Duleba-Dowsett, Tom Hill, Andrew Margetts, John Whittaker, Martin Bates, Kristina Krawiec and Enid Allison

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#### **Abstract**

The buried Wantsum Channel in north-east Kent, UK comprises a 5km wide and 20km long valley that once divided the Isle of Thanet from the mainland. For much of the Holocene and up until infilling in the medieval period, the channel would have been navigable and was considered an important routeway linking the Thames estuary with the English Channel. The landscape in and around the channel feature has captured an almost continuous record of 13,000 years of sedimentation.

The sediments analysed arose from deep boreholes, undertaken as part of a pylon installation project carried out by the National Grid. The scale of recording and sampling undertaken for this borehole transect places it amongst the largest geoarchaeological surveys undertaken in the United Kingdom. Thirty-nine boreholes, encompassing a 13.5km transect across the Wantsum Valley, were lithologically recorded and subsampled for palaeoenvironmental remains. Four key boreholes, the deepest of which contains 27m of late Quaternary sediments, have now been palaeoenvironmentally analysed and dated.

This poster will summarise evidence of both natural and human-induced landscape change interpreted from the geoarchaeological analysis of these sediments. The study documents the natural landscape evolution of the Wantsum Valley beginning in c.13,000 BP, as well as anthropogenic signals beginning in the Early Neolithic and continuing through to the medieval period. Such evidence includes but is not limited to; woodland clearance, declines in specific tree taxa, agricultural practices, and evidence for the destabilisation of the valley slopes that may have contributed to the infilling of the Wantsum Channel.

### Creating land: Understanding the use of space on and around the crannog Moynagh Lough via the investigation of coprolites

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#### **Abstract**

Moynagh Lough is a crannog settlement site in County Meath, Ireland, with occupation phases dating to the early Medieval period. The very creation of an artificial island in a lake makes a crannog a striking focal point within a landscape. Crannogs are highly visible, but it is likely that access rights were controlled meaning they remained exclusive settlements. It is clear that crannog dwellers must have had strong links to people on land as they relied on these communities for essential provisioning.

By applying biomolecular techniques to archaeological coprolites, evidence of the use of space on the crannog and the surrounding landscape will be presented. Using the extraction and analysis of ancient DNA and protein surviving within the material, it is clear that the coprolites were deposited by dogs – the first concrete evidence that dogs lived amongst humans on the island. The dogs ate a varied, but meat-based diet. Dissection of the coprolites has revealed further evidence of butchery occurring on Moynagh Lough. Therefore, it appears that live animals were transported to the island before being killed on the crannog. Authentic DNA evidence of a parasite, *Babesia sp.*, spread by tick bites, also

provides evidence of the landscape use and environmental conditions surrounding the lake when the crannog was in use.

The findings of this study illustrate the prospects and promise of using coprolites as a novel way to understand landscape organisation and land-use in and around crannogs.

## Anthropogenic decline at the end of Antiquity? Land-Use and Land-Cover reconstructions for Lycia-Pamphylia

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### **Abstract**

Lycia-Pamphylia, SW Turkey, is rich in archaeological remains (Jacobson et al., 2022), palynological datasets (Woodbridge et al., 2019), and palaeoclimate archives (Jacobson et al., 2021) that enable in-depth exploration of interactions between humans, agriculture, and the natural environment. When assessed together, these abundant datasets demonstrate that during a long-term dry period at the end of Antiquity there was significant settlement abandonment and contraction, accompanied by a reduction in agricultural intensity and return to widespread pastoralism. Establishing whether the drier climatic conditions contributed to these changes is challenging, especially considering other potential influences such as regional insecurity, interstate conflict, plague, and recurring earthquakes.

This poster further explores the mediating factors between climate and society: agriculture and the environment. Initial attempts at multi-period agricultural productivity modelling and land-use/-cover reconstructions are used to examine the complex interactions between communities in the region and the landscape they lived within.

- Jacobson et al., 2021. Heterogenous Climate in the EMed—The Kocain Cave Record, SW Turkey. *Geophys. Res. Lett.* 48: e2021GL094733. <https://doi.org/10.1029/2021GL094733>
- Jacobson (& Pickett) et al., 2022. Settlement, environment, and climate change in SW Anatolia. *PLoS ONE* 17(6): e0270295. <https://doi.org/10.1371/journal.pone.0270295>
- Woodbridge et al., 2019. Pollen-inferred regional vegetation patterns in Southern Anatolia. *Holocene* 29: 728-741. <https://doi.org/10.1177/0959683619826635>

## Chemotaxonomy: a new tool for discriminating between wild grasses and cereal pollen species?

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### **Abstract**

Pollen records represent numerous indicators of landscape management throughout human history. Despite the presence of pollen from plant crops in pollen archives, their exploration is not always straightforward, especially when the main interest is cereal crops. Traditional pollen analysis is based on morphological differences among pollen grains, which is often hampered by high degrees of similarity between pollen grains from different species, for example across the Poaceae family. This results in the limited use of pollen records in the discussion around the development of cereal cultivation. However, recent studies (Diehn *et al* 2020, Jardine *et al.* 2019, Julier *et al.* 2016) have successfully classified modern pollen grains of the Poaceae family using their chemical spectrum obtained by Fourier Transform Infrared (FTIR) spectroscopy. Our study uses this approach to overcome classification difficulties between wild grass species and cereals.

Modern individual pollen grains, treated with acetolysis were used in our study. The chemical fingerprints of 16 common wild grasses and cultivated cereal species were used as a reference library to train supervised classification algorithms and evaluate the accuracy of their predictions. The mean classification success into species level for individual pollen grains was 80%. The aim of our study is to then use this model to classify fossil pollen. With this contribution I will outline the potentials of the 'chemical fingerprint' for pollen identifications of wild and domesticated grass species as well as the challenges of using this method on fossil pollen records.

### References

Diehn S *et al.* (2020) *Anal Bioanal Chem* 412: 6459–6474

Jardine P *et al.* (2019) *J Micropalaeontol* 38: 83-95

Julier. *et al.* (2016) *Rev. Palaeobot. Palynol* 235: 140-147

The ecology, materials, and aesthetics of unusual fibres in early textiles: A University of Glasgow Ph.D. project

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**Abstract**

The project explores the link between prehistoric peoples' relationship with their environment and choices of foraged fibres for textiles. The disappearance of 'unusual' lesser-known fibres such as tree basts, mosses, vines, etc. in favour of economically scalable domesticated fibres, has left a gap in our knowledge about the properties, sensory qualities, and craft required of these fibres. This project's analysis on the material and sensory properties of prehistoric archaeological textiles across Eurasia, experimental modern equivalents, and the related paleoecology will illuminate how ancient peoples interacted with their environment through textiles. Examination of the relationship of ancient peoples with their environment to choose and acquire fibres for cultural materials may help us to understand how the modern textile industry can change and adapt towards a more sustainable relationship with our own environment.

Mapping underutilised crops in Ireland -- past, present and future

Meriel McClatchie and Sónia Negrão

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**Abstract**

The UN Food and Agriculture Organisation estimates that 75% of crop diversity has been lost between 1900 and 2000. Such loss of biodiversity has serious implications for food security in the context of climate change and environmental degradation. Urgent action is required to diversify our crops and broaden genetic diversity in national contexts. Ireland has a deep and rich history of farming. Evidence from archaeological excavations indicates that Ireland's first farmers began cultivating crops almost 6000 years ago. Although ancient Irish farmers cultivated a wide range of crop species and varieties, nowadays farming is focused on a narrow variety of crops. This has resulted in some crops being underutilised, despite their great potential in terms of being nutrient dense, suited to European climates and environments, and viable for sustainable production in Ireland. A new two-year project (CROPREVIVE) began in September 2022 and aims to align findings on ancient practices (from archaeology and history) with current data from plant sciences to seek resilient crops adapted to sustainable practices, and to tackle environmental, economic and cultural barriers to increased production in a modern context. With a focus on agricultural sustainability,

biodiversity and climate change, the project uses Ireland as a case-study to tackle broader global challenges.

The impact of the kelp industry at Calbost, Isle of Lewis at the end of the 18<sup>th</sup> Century:  
Robert Weir, a progressive and entrepreneurial tacksman

Holley McCoy

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**Abstract**

The industrial exploitation of seaweed to extract alkali salts provided essential chemicals to growing industries from the 17th century through to the early 19th century. The smoke of the burning of seaweed in pits along coasts all over Scotland could be seen in early summer. This process was to make the calcined ashes of seaweed or *kelp*. This industry connected rural coastal areas with the fast-changing economic, social, and political changes during the era of the early Industrial revolution and colonial expansion of the British Empire. The purpose of this PhD project is to understand the role and influence that this industry had on early modern Scotland by focusing on its technology, the social, environmental, and economic impact on those involved within the industry, with the subsequent change of land use and management by drawing on archaeological, historical, documentary, and ethnological evidence.

It is thought that Robert Weir, the last tacksman of Calbost in the north Park district on the Isle of Lewis, obtained the lease for the tacks of Calbost and Gravir as early as 1780. Not much is known about Robert Weir's life, apart from various anecdotes from the oral tradition in Calbost as collected by Angus "Ease" MacLeod, OBE. Angus MacLeod stated that he was known as "one of the most progressive tacksman in Lewis"<sup>1</sup>. The impact of his various enterprises in collaboration with the tenants of Calbost, such as the kelping, agriculture and fish salting industries, will be discussed using a three-pronged approach of commodity chain analysis, conviviality, and connection.

<sup>1</sup> MacLeod, A. n.d. "Overview of the physical features and history of Calbost". In: The Angus MacLeod Archive.

"The Long Man will never wake!": British hill figures in Punch cartoons, 1925-1990

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**Abstract**



Hill figures are a much loved, but widely misunderstood, feature of predominantly southern British chalk downlands. While the Uffington White Horse has been dated to 1000 BCE, most of the other 57 extant hill figures were constructed in the last 300 years. Nonetheless, they seem to form timeless symbols of place and belonging in the public imagination.

In wider research into popular perceptions of prehistory, 20 cartoons from Punch involving hill figures were found, from 1925 to 1990. The majority show “white horses”, of which half are set in an inappropriate past to which their construction is attributed. Other cartoons riff on modern concerns, variously appropriating them in World War 2 defiance, as sites for artists and day trippers, and against modern development of the countryside. Curiously, while several cartoons show the Long Man of Wilmington, the sexualised Cerne Abbas Giant is not directly represented.

This presentation will deploy a semiotic approach to analysing hill figure cartoons, to tease out their denotative content, and clarify their connotations in the contexts in which they were constructed. In particular, the purported humour of many cartoons depends on a supposed lack of understanding of why, or by whom, hill figures were constructed. Thus, while the cartoonists often had real hill figures as models, the cartoons’ effects do not depend on verisimilitude. As with other prehistoric cartoons, this suggests that hill figure cartoons may help reproduce popular misconceptions.

### Living on the Edge: surviving and thriving in the Holocene Humberhead Levels

Presenter: Luke Michno-Neville

PhD Supervisors: M. Jane Bunting, Briony McDonagh, Helen Fenwick

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### **Abstract**

The Humberhead Levels currently exists as a flat, lowland area that today is mostly used for the purpose of arable agricultural. For the majority of the Holocene however, the landscape looked drastically different. Prior to drainage works in 1626 AD, the area of the Humberhead Levels existed as a wetland environment featuring a complex system of rivers and streams. Archaeological evidence has shown the Humberhead Levels was attractive to human

communities during the prehistoric, with lithic evidence for human occupation during the Mesolithic, Neolithic and Bronze Age situated near relict river courses and channels. Throughout the historic period, up until the drainage of the landscape, the economy of the area was one of traditional pastoralism, with residents using the seasonally flooded land for pasture and continuing exploitation of the wetland's natural resources. However, the relationship between the palaeoecology of the landscape and human occupation and land-use has not been heavily investigated. This project examines the relationship between the changing blue-green landscapes of the Holocene Humberhead Levels and the human communities that thrived within them using a combined palaeoecological, archaeological and historical approach. The research of this project will be helpful for not only developing a better understanding of how human communities lived in the Humberhead Levels during the Holocene, but also for identifying possible ways in which human communities can live within blue-green landscapes today using subsistence practices of the past.

#### A14-Producing vegetation models for public engagement

Christine Milton

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#### **Abstract**

The A14 Improvement Scheme was designed to improve the A14 trunk road in Cambridgeshire between Ellington (on the western outskirts of Huntingdon, TL 189 747) and Milton Junction (on the Cambridge Northern Bypass, TL 409 612). During the excavations 1150 environmental samples were sent for analysis including 257 pollen samples from 44 archaeological or palaeochannel features ranging in date from the early to middle Bronze Age through to a late Saxon to early Medieval period.

Various approaches to using the pollen results to create a regional vegetation model have been explored. The Landscape Reconstruction Algorithm REVEALS (Regional Estimates of Vegetation Abundance from Large Sites) analysis has been used to produce an output of estimated proportions of vegetation cover in the wider landscape for each time period represented by multiple samples. Given the varied nature of the samples, this only provides a first estimate. The key limitation of this approach is that it is designed for lakes or peat bogs as it does not account for the homogeneity bias. This means it is assumed that the vegetation of the pollen source area is homogenous. We know this is unlikely to be the case for the A14. From the modelled results the vegetation groups have been zoned based on the local topography, underlying geology, and relationship to waterbodies to create schematic vegetation cover maps. Schematic vegetation cover maps provide a more readily-interpretable simulated visualisation of the vegetation cover around the site allowing the landscape as it would have been experienced by past populations to be visualised by all stakeholders. Such maps can be incorporated into public outreach tools such as ArcGIS StoryMaps. The next step is to test the results through comparison to the other

palaeoenvironmental proxies or through further modelling using the Multiple Scenario Approach (MSA).

### Landscapes of Craft in the Mariana Islands

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#### **Abstract**

In the past the relevance of plants amongst indigenous inhabitants of the Mariana islands was crucial. They provided food, raw material for building and crafting wooden objects including ships and canoes, but also for ritual and medicinal purposes. Up to now, archaeobotanical research in the Pacific has focused mostly on the translocation of several tree species across the Ocean, such as breadfruit (*Artocarpus altilis*), paper mulberry (*Broussonetia papyrifera*), or Tahitian chestnut (*Inocarpus fagifer*) amongst others. In the framework of the NAO project the study of less-known plants such as those used for crafting, specifically for basketry, has been addressed. These plants have been carefully managed for producing adequate raw materials for basket-making, from vegetative propagation to pruning. It will be presented a case-study from Luta/Rota (Marianas Islands) in relation with the use of åkgak (*Pandanus tectorius*) for basketry. This research will also reflect about the possibilities provided by the archaeobotanical record to trace their use in the past and the relevance of maintaining artisanal practices to preserve specific plants and landscapes.

### Lowland heathland: development, management, and exploitation in later prehistory and the Romano-British period

Ed Treasure and Megan Scantlebury

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#### **Abstract**

Lowland heathlands are amongst the oldest recognised cultural landscapes in Europe, forming through complex interactions of human activity and natural processes. Archaeological and palaeoecological records provide a unique long-term perspective on the development of these important and biodiverse habitats, and how they were exploited. This poster uses charred plant remains and wood charcoal recovered from archaeological sites to trace the expansion and creation of lowland heathland landscapes, focusing primarily on the Dorset Heaths in the Poole Basin. We find that the initiation of heathland habitats can

generally be dated to the Bronze Age, however, it is only in the later Iron Age and Romano-British periods that these habitats were routinely and systematically exploited for fuel, grazing, and arable agriculture.

### Building up the Breadbasket: agriculture and settlement in the A14 River Great Ouse landscape block

Kate Turner (presenter, principal author), Kate Roberts (contributing specialist)

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Kate Roberts: MOLA, [kroberts@mola.org.uk](mailto:kroberts@mola.org.uk)

#### **Abstract**

Excavations in the northern section of the A14 Cambridge to Huntingdon improvement scheme, funded by National Highways, revealed a series of structures, enclosures and field systems situated on the eastern banks of the River Great Ouse, thought to be part of a locally important villa estate. Located in the heart of the 'breadbasket' of Roman Britain, archaeobotanical evidence suggests that the site at River Great Ouse may have been a specialised agricultural production centre, with widespread deposits of crops processing waste recovered from contexts dating from the mid to late Roman periods. The quantity and diversity of processing by-products recovered probably represents large-scale crop-cleaning activities. This is supported by the presence of a substantial number of millstones and querns in the finds assemblage, and the identification of a series of structures interpreted as barns or granaries. As is the case with many of the complex farmsteads that developed in Britain during the Roman period, it is likely that the estate constituted a central hub for cereal processing, supplying settlements in the local area and beyond. The finding of rare and exotic plant taxa, such as olive, further supports the interpretation of this site as a high-status farming estate.

### Preliminary Archaeobotanical Results from the Medieval Capital of Northumbria

Alice Wolff

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#### **Abstract**

This poster presents preliminary results of archaeobotanical investigations into agroecological landscapes at Bamburgh Castle in Northumberland during the medieval period. Bamburgh was the capital of the early medieval kingdom of Northumbria in the 6th to 9th centuries CE and remained an important centre in the region until the Norman castle was defeated by artillery in 1464 CE. Previous isotopic study of the skeletons found in the associated cemetery have demonstrated that individuals from across Europe were buried at Bamburgh in the 7th to 9th centuries CE. A preliminary study of economic species found in

archaeobotanical samples from Bamburgh shows an increased diversity of cereal choices in this same period as compared to the earlier or later periods of occupation at the site, suggesting a possible link between the migrations to the site and demand for different cereal types. Additionally, the preliminary results show an increased presence of legumes in later periods at the site. This poster considers possible explanations for the apparent increase in legumes from the ninth century onward, such as the need for more nitrogen fixation in the fields supplying Bamburgh with crops or an increased focus on garden crops in this period.