Wetland Archaeology in Ireland and Beyond

Conference 6th-7th February 2010

Theatre N, Newman Building, University College Dublin,
Belfield, Dublin 4, Ireland

ABSTRACTS OF PAPERS

Wetlands are an intrinsic part of the Irish landscape. They have also been at the heart of numerous archaeological investigations, particularly over the last 25 years. Although a relatively recently coined term, Wetlands encapsulates a critical range of landscapes, locations and places – exploited, revered, feared, crossed or ignored in different measure by various groups of people across both time and space. Today in Ireland they are in many respects either marginal or exploited. However, both their environment and their archaeology create very special and important places, an importance and uniqueness recognised by World Wetlands Day and the designation of 45 Ramsar sites from across Ireland.

This conference builds on a long tradition of archaeological examination of Irish wetlands. Papers were sought that introduce new research, or explore new approaches to previous research, with specific reference to peoples' interactions with wetlands. Papers work at various scales from the wide to the site specific and across different themes from the sacred to the profane to the environmental.

Papers at the conference are broadly grouped into sessions of archaeological and environmental studies at small and large scales. The first day will focus on site-level studies mainly relating to individual sites or excavations and environmental studies at a local scale. The second day will feature inter-site papers, surveys, regional level environmental studies and multidisciplinary projects. Individual projects wishing to present more than one paper were requested to submit proposals across the scales and themes of the conference.

	6th February	7th February
Morning	Session 1: Archaeological 1	Session 3: Archaeological 2
Lunch	Posters	Posters
Afternoon	Session 2: Environmental 1	Session 4: Environmental 2

For further information please visit our website at
www.ucd.ie/archaeology/wetland2010

or contact the Organising Committee at
wetland.archaeology@ucd.ie

Saturday 6th February

A Peatland Habitation Site from Ballykean Bog, County Offaly

Sinclair Turrell (Archaeological Development services Ltd)

In June and July 2009 a second and final phase of excavation took place at Ballintemple habitation site, Ballykean Bog, Co. Offaly. Several new discoveries were made during the course of the campaign and some of the questions raised by the 2007 excavation answered. The site is situated on a low mound of peat in the northeast corner of Ballykean Bog and consists of a circular house, some 9m in diameter, surrounded by a palisade 20m in diameter. The house had a central hearth, internal dividing walls, a double external wall and entrances to the east and west. It was originally thought to have had a circular backhouse to the rear but this now seems have been a rectangular platform. The palisade had an entrance on the eastern side and may have been topped with blackthorn. There was a double row of palisade posts in places, which appeared to represent structures, complete with hurdle floors in some cases, built up against the palisade. These are most likely to be animal pens. The area between the house and palisade was covered with a layer of wood chippings and brushwood, in some places supporting timber surfaces. The site seemed to have experienced severe subsidence and may have been abandoned after a relatively short period of occupation. A variety of artefacts, mostly domestic in nature, were recovered from the site. Amongst these was a range of wooden items, including an oar, a spatula, a small box, a decorated comb, handles, needles and several miscellaneous items. The leather items discovered included several well-preserved shoes. Organic remains recovered included a quantity of animal bone from around the hearth, as well as deposits of fruit stones and seeds.

Adventures in the Pill: early waterfront structures at Ormond Quay Upper, Dublin 7

Teresa Bolger

In late 2007 and early 2008 an archaeological excavation was undertaken at a site in the inner city of Dublin on the north shore of the river Liffey directly opposite the site of Wood Quay and the original Norse town. During the medieval and early post-medieval period this area was known as 'the Pill' as the confluence of the River Liffey and one of its main northern tributaries, the River Bradogue had created a landscape of creeks, inlets, channels, sand-bars and dividing islets. In the late 17th century the area was infilled and reclaimed to create the modern quay frontage.

The Ormond Quay site is located towards the western end of 'the Pill'. This paper will examine how the archaeological excavations at the site contribute to our understanding of the original topography of the site and the foreshore in this area. The main focus, however, will be on the two stratified timber structures uncovered within the river gravels in the south and southeast of the site. The earlier structure was a timber-laced gravel embankment with associated hurdle path. This was succeeded by a brush-wood platform. Both structures have been dated to the Iron Age (*c*. 160-60BC). The earlier structure, in particular, is very unusual and to date no direct comparanda have been identified, though research in this area is on-going.

Environmental samples associated with the structures shed light on the local environment during the Iron Age, how the site was used and the possible impact of the structures on the topography and evolution of the foreshore.

An Iron Age causeway in Annaholty Bog, Co. Tipperary

Kate Taylor (TVAS Ireland Ltd)

A large timber causeway was excavated in Annaholty Bog during archaeological works in advance of the N7 Nenagh to Limerick High Quality Dual Carriageway. Annaholty Bog covers a large area straddling the Limerick-Tipperary border between Castleconnell village and the Silvermines Mountains and would have been a major obstacle to north-south travel.

The causeway was originally 65-70m long, connecting two dry islands in the bog and at 7m wide would have been capable of taking heavy two-way traffic. The method of construction was the same as that of the renowned trackway at Corlea, Co. Longford: two lines of roundwood runners were laid

along the length of the track and large planks were laid side by side on top, held in place by pegs. Towards the centre of the site, halfway between the dry islands, the underlying peat was wetter and softer. In this area several layers of roughly parallel timbers underlay the main planks and patches of brushwood were also used as a foundation layer.

A total of 1,112 pieces of wood were recorded and lifted from the site. Of these, over 350 were obviously worked. The worked pieces included some of the planks that had mortice holes at the ends for the pegs, the pegs that had finely sharpened points, numerous cut branches and logs and a number of wooden artefacts. The artefacts included several vessel fragments, a barrel stave, a broken yoke and part of a cart. Dendrochronological dates obtained from some of the large oak planks place the construction of the causeway around 40BC.

A separate collection of worked timbers was recovered from the bog nearby and these may represent another, destroyed, trackway. A radiocarbon date places these timbers in the Iron Age also, although slightly earlier than the causeway.

Irish Iron Age bog bodies unveiled: The National Museum of Ireland's Bog Bodies Research Project

Isabella Mulhall (National Museum of Ireland)

This paper presents the approach taken by the National Museum of Ireland to organise the scientific examination by a team of international experts of two Iron Age bog bodies discovered in 2003 and outlines a policy for the treatment of future discoveries of bog-preserved remains.

The discovery in 2003 of the remains of two adult male bodies in peat bogs in the Irish midlands provided a unique opportunity to gain new insights into Iron Age Ireland. The unearthing of soft tissue remains from bogs is a rare occurrence, and the double find of exceptionally preserved Iron Age bog bodies at Clonycavan, Co. Meath and Oldcroghan, Co. Offaly within three months of each other was unprecedented. The remains came to the NMI where the Bog Bodies Research Project was established to analyse and document the remains, to explore how they came to be deposited in bogs and to attempt to determine the rationale behind their deaths.

What ensued was an intensive multidisciplinary investigation involving the collaboration of personnel from the NMI and specialists from six different countries. A wide variety of analyses was carried out including fingerprinting, CT and MRI scanning, pathological and anatomical assessments, facial reconstruction and palaeodietary analysis, all of which produced a wealth of exciting results. Scientific data was obtained regarding age at death, stature, health and wellbeing, diet and the manner in which the men were killed before their disposal in bogs.

The project led to the creation of a permanent exhibition entitled 'Kingship and Sacrifice' which showcases the main findings of the investigation.

During the course of the project, a policy was developed for dealing with future discoveries of bog-preserved remains. Since the establishment of the project, three further instances of human remains have come to light in bogs and are currently being examined and documented as part of ongoing work relating to the Bog Bodies Research Project.

A unique insight into a pre-historic landscape at Ballybeg Bog, Co. Offaly

Nicola Rohan (Archaeological Development Services Ltd)

Ballybeg Bog is located at the eastern foot of Croghan Hill, Co. Offaly within an archaeologically rich landscape that encompasses past human interaction with the dryland and wetland landscapes within this area. The bog is located within the Bord na Móna Derrygreenagh Group of Bogs and has been subject to survey and subsequent excavations that illustrate past human interaction within this environment and included a substantial number of prehistoric toghers and platforms that were located in open wet woodland and along the routes of palaeochannels.

The most unusual site investigated within Ballybeg Bog was a pre-historic stone enclosure with associated charcoal and mixed stone and charcoal deposits. This site was partially excavated, in 2002, and was subsequently investigated, in 2008 and 2009, in preparation for preservation in situ. The site

measures 45m in length and 35m in minimum width. The unique stone enclosure is located at the southern end of the site and is composed of a single course of stones 1.5m in width, which enclose an internal area measuring 7m by 8m. A series of charcoal and mixed charcoal and stone deposits are recorded to the north of the stone enclosure. A substantial number of lithic artefacts have also been recovered from the site.

This site is both unique and important as it illustrates peoples' interaction with the wetland environment, whether for economic, social or ideological motives and in a manner that is rarely seen in a pre-historic wetland environment. Post excavation analysis is currently ongoing and will provide secure dates and an environmental background for the site.

Medieval fishweirs at Boarland Rock, Fergus estuary, Co. Clare

Aidan O'Sullivan[1], Mary Dillon[2], Conor McDermott[1] and Robert Sands[1] ([1]UCD School of Archaeology and [2]Archaeobotany Ireland)

Recent Heritage Council-funded intertidal archaeological surveys on the Fergus estuary have lead to the discovery of a spectacularly well-preserved medieval fishweir complex of *c*. 20 wooden V-shaped traps, dating from the early 12th to the early 15th century AD. The complex is situated at Boarland Rock in the middle of the estuary channel, is *c*. 1.5km from drylands and can only be accessed by boat, at very low tides during good weather conditions and then only can be inspected for 2 hours. The extraordinary logistical difficulties are matched by extraordinary archaeological survival. Boarland Rock 1, dated to AD 1414-1444, is a large V-shaped wooden structures, with exposed post-and-wattle fences up to 120m in length, with clear evidence for multiple phases of rebuilding and repair. Other structures are similarly well-preserved, with post-and-wattle fences, hurdle panels, woven baskets and wooden ropes. All structures are being actively eroded and destroyed by waves, currents and tides. The paper will describe the archaeological material, the emerging results from initial surveys and environmental sampling and will outline some future work intended on this remarkable, but endangered medieval fishing landscape - one of the finest known from medieval Europe.

Structures & junctions – Edercloon in the Late Bronze Age and Early Iron Age

Caitríona Moore

During the centuries of the Late Bronze Age and Early Iron Age the construction of toghers and platforms at Edercloon, Co. Longford, resulted in a network of interconnected and parallel route ways. This paper will focus on the highly unusual structural patterns which characterise this period of activity at the site. Drawing on the results of the excavation, scientific dating and palaeoenvironmental evidence, it will attempt to outline the sequence of construction and events at the site, during what was a period of very intensive and repeated focus.

Approaching Iron Age Wetland Landscapes: excavation at Cults Loch, Galloway, SW Scotland

Anne Crone and Graeme Cavers (AOC Archaeology Group, UK)

Recent paradigms in wetland archaeology have emphasised the importance of understanding the role of wetland settlements within the physical, social and political landscapes they occupy, and the centrality of such an appreciation to any understanding of their significance. Although apparently first and foremost designed as houses, crannogs were also highly symbolic structures, occupying complex political as well as formalised agricultural and territorial landscapes: island settlements were not isolated, and cannot be studied in isolation. This premise was central to the formulation of the Scottish Wetland Archaeology Programme's research agenda, and forms the basis of an ongoing research campaign at Cults Loch in SW Scotland.

The focus of SWAP's work on the loch has been on an unusual enhanced promontory site dated to the mid first millennium BC. However, the importance of this site is further heightened by its situation within a densely populated landscape of later prehistoric monuments, including other crannogs, forts, palisaded enclosures and funerary monuments. As such, the Cults complex offers the opportunity to maximise the value of 'high-resolution' wetland data within the context of later prehistoric landscape

evolution, and the chance to explore the social and practical function of crannogs in parallel with contemporary settlements in the vicinity.

This paper will discuss SWAP's approach to the rich and varied later prehistoric landscape at Cults, outlining the results of the excavations and the multi-disciplinary approach being taken to post-excavation and environmental analyses.

A multi-proxy palaeoecological investigation of a multi-period burnt mound complex, Ballygawley, Co. Tyrone.

Ed Bailey, Paul Masser and Scott Timpany (Headland Archaeology UK Ltd)

New road development schemes taking place across Ireland are providing opportunities for both archaeological and palaeoenvironmental investigations in areas hitherto unstudied. At Ballygawley, Co. Tyrone on the A4/5 road corridor a complex of twenty-three burnt mounds with associated troughs, pits and stakeholes were uncovered together with a unique circular wicker-lined feature. The waterlogged nature of the site, comprising peats, silts and palaeochannels has provided great potential for multi-proxy palaeoecological studies including: pollen, plant macrofossils, wood and beetle analyses.

A suite of radiocarbon dates from the burnt mounds and associated features has shown burnt mound activity at Ballygawley took place from the Neolithic (3340-3020 cal BC) through to the medieval period (cal AD 1050–1270). The burnt mound activity appears to follow the changing course of palaeochannels running through the site; with activity shifting across the site as the course of the channels change.

This talk aims to present the results from the wide range of palaeoecological investigations undertaken at the site and to see if these were able to answer the elusive question – what were they for?

Wetland Geophysics; Some Applications in Irish Archaeological Settings

Kevin Barton, James Bonsall and Heather Gimson (Earthsound Associates)

Wetland environments present unique challenges to geophysical surveys. This is largely due to site access, uneven and unstable ground and most importantly a deep and variably wet host media which does not always provide measurable geophysical property contrasts or responses with possible buried archaeology.

This paper discusses results from three studies which demonstrate the applicability of geophysical techniques in different wetland and archaeological settings.

To assess the application of geophysical techniques we have carried out experimental surveys in the Céide Fields Neolithic landscape in North Mayo. We will present a multi-method survey over pre-bog walls whose top surfaces lie at varying depths beneath the peat. The relative merits of electrical, magnetic and electromagnetic techniques will be compared to the results from traditional sounding using wooden and metal rods.

The N4 McNeads Bridge Road Scheme runs through peatland in Westmeath. An NRA Pilot Study used magnetic susceptibility, magnetic gradiometer and earth resistance surveys along the route. The surveys failed to identify two fulacht fiadh - a site type which usually creates a strong, coherent geophysical response. The survey results will be compared with excavation data to determine why the multi-method approach failed and how it could be improved for the future.

The enclosing elements of the Woodstown Hiberno-Scandinavian site in pastureland on the banks of the River Suir near Waterford City were mapped by conventional 2-D geophysical surveys. The finding of possible boat nails combined with the proximity of the site to an adjoining tidal wetland raised the possibility that there may have existed a harbour or area for the laying up of boats. The wetland was investigated using palaeo-environmental reconstruction techniques which were facilitated by a 3-D model constructed from electrical resistivity tomography (ERT) depth sections. We will discuss the contribution ERT made to the reconstruction and the conclusions reached.

Revealing the ancient environment at Edercloon

Dr Nóra Bermingham, Dr Gill Plunkett, Dr Eileen Reilly and Dr Ingelise Stuijts

A key to understanding many archaeological sites is the reconstruction of ancient environments achieved through the investigation of multi-proxy fossil data sets. Around 45 wooden trackways were discovered during archaeological investigations within an area of reclaimed raised bog at Edercloon, Co. Longford. The excavations, conducted by Caitríona Moore on behalf of CRDS Ltd for the National Roads Authority, involved a programme of palaeoenvironmental work that included stratigraphic and topographic survey and analyses of pollen, plant macrofossils, testate amoebae, insects, wood and tephra with additional chronological control provide by AMS dates. The investigations have provided a new long-term record of landscape change dating from the late Mesolithic to the early medieval period with preliminary results now available. The results suggest links between site construction and environmental change with trackways constructed within a dynamic and changing landscape both on and around the bog. For example, a dry phase, identified in the testate record, dating to the Iron Age is accompanied by increased trackway construction. The insect record has provided multiple local environmental records directly linked to trackway construction and has revealed trackways as significant micro-habitats with implications for distinguishing between natural and artificial habitats in the fossil record. Pollen studies have shown that the wider landscape was consistently characterised by mixed woodland, which contracted and regenerated over time, but which was never drastically cleared, even at times of considerable human activity on the bog. Patterns of wood species selection for trackway construction and artefact production provide insight into the exploitation and use of local resources. In this paper, the preliminary results of the various investigations are integrated to provide an overall picture of human-environment interactions at Edercloon from the late Mesolithic.

A Brief Overview of the Wood and Plant Remains Results from Kilbegly Mill, Co. Roscommon

Ellen OCarroll & Susan Lyons

The horizontal mill site was excavated by Neil Jackman in advance of the proposed N6 Athlone–Ballinasloe by Valerie J Keeley Ltd on behalf of Galway County Council and the National Roads Authority. It was located in Kilbegly townland, which is approximately 4 km east of Ballinasloe. The site location was non-riverine and non-tidal, with the millpond appearing to be fed by natural springs and the high water table of the area.

This paper aims to integrate the wood results with the plant macro and to a lesser extent the pollen analysis (Michael O Connell & Aneta Overland, UCG) to re-construct the associated environments and wood use. These complementary approaches form the bases of palaeoecological reconstruction and archaeological modelling of how the local woodland and landscape surrounding the mill was exploited during the medieval period.

The waterlogged nature of the deposits at Kilbegly provided the perfect environment for the preservation and survival of wood and botanical remains. The wood remains used to construct and operate the mill site were subject to species identification, wood selection and environment/woodland re-construction at the time of construction of the mill site. Five hundred and three wood samples were analysed from the remains of the horizontal watermill which were from structural timbers, wattle rods, wood chips and ninety nine wooden artefacts. The wood from Kilbegly could not have all been derived from the same source and analysis suggests that a variety of woodlands were exploited: broadleaf, wet, coniferous, coppiced and scrub environments. Coppiced hazel woods as well as oak, ash and yew trees were exploited. Scrub such as holly, pomoideae and Purgin buckthorn were also present in the identifications. Wetland taxa which included alder, birch and willow, would have grown close to the mire area located close to the mill site. The wood types selected for use in the manufacture of the artefacts is reminiscent of a site which is industrial rather than domestic

A total of 200 waterlogged soil samples were selected for plant macrofossil assessment. The overall aim of this assessment was to highlight the concentrations of plant macrofossil remains and the diversity of these plant communities associated with the deposits excavated from Kilbegly. Species belonging to the *Raunuculus* sp. (buttercup), *Chenopodium* sp. (goosefoot), *Polygonum* sp. (knotgrass) and *Rumex* sp. (dock) were primarily identified, which are all ruderals, or species common to

disturbed open ground. Other species indicative of nitrophilous conditions, grassland, wet or muddy areas and woodland/scrub were also identified. Interesting observations were the very low occurrences of cultivated plant remains (oat and barley) and species associated with cultivated fields and arable land, given the context of the site. The diversity of plant species recorded also serves to illustrate the crude nature of early farming and how patchy the agricultural fields may have been.

The wood identifications compare well to the pollen analysis results and the plant macro studies, all of which depict a disturbed and somewhat waterlogged open landscape with marginal scrubland and hazel coppice present in the area during the construction and use phase of the mill site.

New insights into the riverine environment and landscape of pre-Viking Dublin: palaeoenvironmental analysis at Clancy Barracks and Ormond Quay, Dublin

Eileen Reilly, Ryan Allen, Ben Geary, Emma Hopla and Lorna O'Donnell

Over the last 30 years, re-development of the centre of Dublin city has resulted in the excavation of large sections of the original Viking and medieval settlement. However, more recently, a number of sites have come to light suggesting that elements of the prehistoric landscape of Dublin may also survive within the modern cityscape (McQuade and O'Donnell 2007).

At Clancy Barracks, Islandbridge, 2km west of the city centre, Kevin Lohan of Margaret Gowen and Co. Ltd., excavated a Late Bronze Age-Iron Age riverfront revetment/platform (Lohan 2008). On Ormond Quay, directly opposite the Viking settlement at Wood Quay, Teresa Bolger, also of MGL, excavated another wooden revetment of very different construction, this time of later Iron Age date (Bolger 2008).

Multiple transects across and through the wood layers of both sites were sampled for wood, plant macrofossils, insects and, in the case of Clancy Barracks, pollen and other microfossils. This multi-proxy approach has provided fascinating insights into the Iron Age environment of Dublin including the presence of ancient woodland along the riverbank with its attendant rare woodland insect fauna. Other insects and plant remains reveal details about the nature of the river itself and its tributaries at this time. This paper will outline the palaeoenvironmental results, the archaeological significance of the sites and their locations and how this is all contributing to a better understanding of the pre-Viking riverine environment and landscape of Dublin.

References

Bolger, T. (2008) Archaeological monitoring and excavation at 31–36 Ormond Quay Upper/Ormond Place/Charles Street West/Ormond Square, Dublin 7 Licence No. 04E1206. Unpublished excavation report, Margaret Gowen and Company Ltd.

Lohan, K. (2008) Archaeological excavations at Clancy Barracks, Dublin 8 Licence No. 07E0261. Unpublished excavation report, Margaret Gowen and Company Ltd.

McQuade, M. & O'Donnell, L. (2007) Late Mesolithic fish traps from the Liffey estuary, Dublin, Ireland. *Antiquity* 81 (313), 569–584.

Dr Eileen Reilly, independent palaeoentomologist
Ryan Allen, independent archaeobotanist
Dr Ben Gearey, Birmingham Archaeo-Environmental, Birmingham University
Emma Hopla, Birmingham Archaeo-Environmental, Birmingham University
Lorna O'Donnell, independent wood and charcoal specialist

Sunday 7th February

Title Pending

Margaret Keane and Sean Kirwan (National Monuments Section, Department of the Environment, Heritage and Local Government)

Abstract pending

Torture or Ritual: Interpreting Irish Iron Age Bog Bodies

Eamonn P. Kelly (National Museum of Ireland)

The paper will present an interpretation of Irish Iron Bog bodies based on a variety of sources including interpretation of the scientific analysis of recent finds, insights obtained from early Irish written sources, evidence from the wider archaeological contexts of the finds and from folklore and folk tradition.

The detailed scientific examination of two bog bodies from Oldcroghan, Co. Offaly and Clonycavan, Co. Meath has revealed that the victims were mutilated in a number of ways that might be interpreted either as torture or ritual activities. The nipples of both men were cut in a similar fashion, being pinched and cut from above, but not fully detached. In the case of Oldcroghan Man, withies were inserted into holes cut into his upper arms. Only the upper torso and arms of Oldcroghan Man was located, the body having been truncated and decapitated, with the lower body and head disposed of elsewhere. The lower part of Clonycavan Man was missing also and although the body was damaged in recent times there was evidence to suggest that it too had been truncated in antiquity. Clonycavan Man was not decapitated however.

Conducted as part of the National Museum of Ireland's Bog Bodies Research Project, research into the Early Irish written sources and into the wider archaeological contexts of the bog bodies has provided a wealth of new, and hitherto unpublished information. Evidence from a variety of sources supports the interpretation that the killing and mutilation of Oldcroghan Man and Clonycavan Man was ritual in nature. Further insights into the nature of this ritual behaviour are provided by the status of the men as inferred from their diets, from the condition of the hands of Oldcroghan Man, the armlet worn by Oldcroghan Man and the hairstyle of Clonycavan Man. Other supporting evidence is provided by the conclusion that the men were killed at different times of the year, that they may have been provided with a final ritual meal and that their deaths and interments took place at important boundary locations.

Peatland excavations and surveys in BnM Peatlands 1999–present

Jane Whitaker MA MIAI (Archaeological Development Services Ltd)

Archaeological Development Services Ltd (ADS) have been consultant archaeologists to Bord na Mona (BnM), Ireland's international supplier of peat products and services since 1999. During this time Jane Whitaker, ADS' Operations Manager - Peatlands has overseen some one hundred archaeological investigations, including excavations and field surveys, on behalf of BnM in their industrial peatlands.

These excavations have covered a variety of site types from trackways, platforms and deposits of worked wood to the recovery of artefacts and the recent excavation of an extensive habituation site in Ballykean Bog, Co Offaly.

While this work was initially limited to the identification of the site types, their composition and local environment, ADS, in co-operation with their academic partners and Bord na Mona, has progressed and developed the archaeological approach to peatland work, to incorporate a broader research based landscape questions while still fulfilling Bord na Mona's statutory obligations in respect of the archaeological resource.

Northern Ireland's foreshore frontier: archaeological research on the intertidal zone and beyond

Thomas McErlean (Centre for Maritime Archaeology, University of Ulster)

The foreshores of Ireland are a major component of the island's range of wetland environments and one which, at various times in the past 10,000 years of have witnessed intense human activity. However the country's intertidal zone, with a number of notable exceptions, has been subject to little systematic survey in spite of the fact that it has been demonstrated to be a major zone of survival of archaeological material. As a result of contemporary accelerated climate change and rising sea level rise the foreshore is going through a dynamic period of change with intertidal sites undergoing severe attrition. A scenario of the probable loss of many important yet to be discovered sites needs to be addressed.

Based on the evidence of the intertidal zone on the coastline of Northern Ireland the paper will attempt to outline our currant state of knowledge and assess its archaeological potential. Future survey strategies and research themes specifically focused on the foreshore will be proposed.

Practically ritual? The practice of artefact deposition at Edercloon, Co. Longford

Caitríona Moore

In 2006 the excavation of a major complex of wooden trackways and platforms at Edercloon, Co. Longford, yielded a large assemblage of wooden artefacts from structures of predominantly Late Bronze Age and Iron Age date. Ranging from spears and vessels to wheel fragments and many objects of unknown function, this is one of the largest wooden artefact assemblages ever to be archaeologically recovered from a raised bog in Ireland.

Spatial analysis of the distribution of these artefacts has identified very clear patterns of object deposition, indicating that the placing of these items was a highly structured practice that spanned several generations. This has also been borne out by study of the objects themselves, which include a collection of artefacts unique to Edercloon, the manufacture of which spans almost a millennium. Further evidence of the inter-generational character of the assemblage is the potential retrieval and redeposition of a small number of items.

This paper will present the results of a detailed study of the Edercloon artefact assemblage, and address how the inclusion of objects at the site fits into the wider picture of artefact deposition in trackways in both Ireland and beyond. It will also seek to discuss the potential meaning behind this deposition and the role it may have played at the site.

Wetland Deposition: context, content and contrast

K. Becker

This paper will review aspects of wetland deposition, in terms of contexts, types of objects and contrasting practices. Abstract pending

The Fergus estuary and islands: new views over an estuarine landscape

Mary Dillon[1] and Aidan O'Sullivan[2] ([1]Archaeobotany Ireland and [2]UCD School of Archaeology)

Intertidal surveys in Ireland continue to present a unique, and still largely untapped, archaeological potential for understanding past human-wetland environment interactions. Recent Heritage Council-funded intertidal archaeological surveys on the Fergus estuary, Co. Clare (2008–2009) are building evidence towards an understanding of a unique maritime historic landscape in Co. Clare in southwest Ireland. Cartographic, historical and archaeological research indicates that the surrounding landscape is remarkably rich in cultural heritage, but the estuary and its islands remain remarkably poorly understood. Recent intertidal archaeological surveys have lead to the discovery of Iron Age post alignments up to 230m in length, Bronze Age post-and-wattle structures, early medieval, medieval and post-medieval fishweirs and post-medieval seaweed harvesting walls, piers and landing places and reclamation features. Following the recent catastrophic flooding on the River Fergus, this paper

will explore how past human populations have lived within this remarkable wetland environment and will outline some potential future research and public outreach activities.

You can't always get what you want': a client's perspective on wetland archaeology

Rónán Swan (National Roads Authority)

There has been an inevitable impact on wetland archaeology by the expansion of the national roads programme in Ireland over the course of the first decade of the 21st century. This paper proposes to examine these impacts and to what extent were they avoidable or even foreseeable. The paper also proposes to review underlying policies and methodologies, and, ultimately, hopes to engage with and perhaps challenge long-established assumptions about wetland archaeology, within the context of development-led excavations.

Palaeoecology, sedimentology and archaeology: untangling the environmental and human history of Belderrig, north County Mayo, Ireland

Naomi Holmes, Graeme Warren and Steve Davis (UCD School of Archaeology)

The current project, 'Climate change and the adoption of agriculture in Ireland', aims to answer the question of how past human societies in North Co. Mayo responded to changes in climate and their environment. Existing research in this region provides a strong archaeological and environmental understanding of settlement, and the Céide fields are important internationally in discussions of Neolithic settlement. Many recent models across Europe have suggested that events such as the adoption of agriculture in Europe are climatically driven and hints of this relationship are present in existing North Mayo data. The environmentally sensitive nature of the area means that North Mayo is an ideal case study for the relationship between climate change and changes in human settlement.

This multi-proxy palaeoenvironmental study of two lake sites in Co. Mayo aims to produce new data at both a local and regional level. Two sites were selected and sampled; one lake near to the archaeological site at Belderrig, and one located further away from any known archaeology. Results of the core scanning along with chironomid records will be presented. Core scanning produces high resolution geochemical and sedimentological data which give information about past processes within the lakes and their catchments. The chironomid analyses will provide quantitative reconstructions of past summer temperatures in North Mayo, providing an insight into local climate, with a specific focus on the Mesolithic – Neolithic transition and the decline of early agriculture in the region.

An Appraisal of the Archaeology of N. Ireland's Rivers: a catchment-based approach

Rory McNeary (Centre for Maritime Archaeology, University of Ulster)

The European Union has begun an important programme called the Water framework Directive (WFD) that requires a management plan for all major European rivers to achieve 'good ecological status' by 2015. With this directive comes a recognition that river management has to be addressed not on a site-by-site basis but by taking into account catchment influences on rivers. The Northern Ireland Environment Agency (NIEA) has been primarily concerned, in the context of river conservation, with managing and improving water quality. Its influence in protecting the cultural heritage value of rivers has been largely achieved through the provision of advice to other government agencies, such as Planning Service, Rivers Agency and others. To-date no coherent attempt has been made to collate existing records of archaeological material, sites and structures from riverine environments, making it difficult for the NIEA to develop an appropriate and coherent protection strategy. A new research post, tasked initially with creating a baseline survey of the cultural heritage relating to rivers, has been set up by the NIEA in conjunction with the Centre for Maritime Archaeology (CMA). This initiative marks the first step in undertaking integrated management action to assess and protect riverine [and lacusturine] archaeology in N. Ireland. This paper reports on the catchment-based approach to the quantification of the riverine archaeological resource that is being developed at the CMA. This method is inspired by similar spatial approaches currently being undertaken as part of the implementation of the EU-WFD by other river scientists,

river managers and government agencies working throughout Europe. The archaeological information gathered from this formative desk-based study will be brought together and presented in a GIS. This work will ultimately help the future preservation and conservation of riverine-related archaeology in Northern Ireland as well as outline fields for future multi-disciplinary research.

Sequencing and correlation of wetland archaeological and environmental records in the Irish Midlands: the need for robust chronological approaches

I.P. Matthews[1], N.P.Branch[2], D.S. Young[2], K. Denton[1], J. Whitaker[3] ([1] Centre For Quaternary Research, Royal Holloway University of London, [2]School of Human and Environmental Sciences, University of Reading and [3]Archaeological Development Services Ltd)

Testing the relationships between humans and environmental change requires precise and accurate chronologies of both archaeological and environmental records. Current chronological approaches to these types of record frequently fail to generate sufficiently precise and accurate age models to test spatial and temporal linkages. Here we combine micro-tephrostratigraphy with Bayesian-based age models in order to test the potential of these approaches in the sequencing of human activities and environmental change in Irish wetlands.

Micro-tephrochronology is the study of non-visible distal ash layers which can be used as isochronous marker horizons to correlate and date sediment sequences. It is a widely used tool in palaeoenvironmental research across northwest Europe, but its potential contribution to chronological and stratigraphic control in archaeological contexts has not yet been fully realised. This is in part due to the unique challenges of archaeological investigations which frequently involve complex stratigraphic sequences and short fragmentary records.

This presentation summarises new results of tephrostratigraphic investigations in the Irish Midlands funded by INSTAR project 16718). It illustrates the importance of building comprehensive regional tephrostratigraphic frameworks before tephra layers in archaeological records and the relationships between human activities and environmental change can be properly understood. Age-models are presented that estimate the timing of the construction and abandonment of a habitation site and wooden structures at Ballykean Bog, County Offaly and Kinnegad Bog, County Meath. These sites are then compared with the available regional environmental records.

Trouble or opportunity? Marginal woodlands

Ingelise Stuijts

Ireland looks like a soup plate: hollow in the middle with raised surrounds and filled with large areas of brown peat. Rivers run like arteries through the centre. A few eskers (raised gravel ridges), remnants of the Ice Ages also provided safe passages. Otherwise the heart of Ireland is very much dominated by bogs and lakes. Over time the extent of bogs has changed dramatically. This had a very definite effect on the mobility of prehistoric (and historic) people. Moreover, marginal woodlands surrounding bogs could form an additional barrier, if one wanted to visit them in the first place. Riverbanks carried their own vegetation, along quiet streams or in dynamic braided rivers. This presentation will compare three settings and investigate the relationship between prehistoric people and the marginal woodland: Derryville bog in County Tipperary, Derragh Island in County Longford and Edercloon, also in Country Longford.

Using ground-penetrating radar to image features within peatlands: a feasibility study from four Irish bogs

D. Howell, T. Astin, N.P. Branch and D.S. Young (School of Human and Environmental Sciences, University of Reading)

A feasibility study carried out in Irish milled peat bogs reveals the potential for large-scale GPR surveys to be undertaken as part of routine assessment of the archaeological resource. Detection of buried wooden structures of various sizes and composition is possible, and discovery and mapping of such structures by GPR could aid in both preservation and excavation strategies and minimise the

destruction caused by milling activities, effectively converting the current discovery system from a reactive to pro-active one.

Detection of large-scale changes in basin stratigraphy is also possible, especially with regard to the lake sediment/peat interface and thick layers of wood. This indicates that major environmental events such as the lake-bog transition and prolonged dry phases can be detected and traced over large areas without the need for extensive coring. Detection of more subtle internal stratigraphic variations is more problematic, with variations in the physical properties of peat cores correlating poorly with the GPR data. The system has also only been found to penetrate to approximately 5 metres below the surface of the peat, leaving any significant structures below this depth effectively invisible.

A number of unidentified contacts have been discovered during the survey, along with a possible wooden platform structure. Evidence has also been collected suggesting buried structures are affected by milling activities long before they are unearthed at the surface, in the form of differential compaction of structures due to the repeated movement of heavy machinery across the bog surface above them. Both the contacts and the effect of milling on structures should be the focus of further research. Modifications to the equipment and survey method are also suggested for future research, including the collection of high-precision GPS and topographic data during surveying.

Wetland archaeology – what's in it for the palaeoecologist?

Chris Caseldine (School of Geography, University of Exeter)

Over many decades the development of wetland archaeology has been underpinned by a range of palaeoecological specialists contributing significantly to our understanding of such environments and the way in which humans have interacted with such environments. By the very nature of the relevant techniques this underpinning is expensive and time consuming, and has been achieved either through the successful establishment of units or by collaborations with university departments.

As pressures on budgets grow, and as the environments within which universities operate change this is perhaps a good time to review what has been a very successful development, especially in academic terms, and particularly in Ireland, and to consider what the future might hold. Rather than look in general at these issues, they are considered from the palaeoecological viewpoint, or rather through a palaeoecological filter.