IQUA

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Editor: Stephen McCarron

1. Introduction

Dear All,
Welcome to the summer (?) newsletter. I hope you find something of interest within to wile away a sheltering hour.
To sort out definitively (in true IQUA style) whether a mild winter, a warm dry spring and a torrentially wet mid year is actually part of a new climatic regime, or part of a forgotten pattern possibly well know to Ireland's early settlers, IQUA plans to examine the light members of the Quaternary research community can throw on this globally important topic in its Symposium later in the year.
Ongoing research on Ireland's past ice sheets has demonstrated the climatic sensitivity of the north-eastern Atlantic, making records from this region critical in informing global debates on the nature and pattern of climatic change throughout the historic and geologically recent past.
We hope to attract the best of Irish (and global) researchers to debate the issues surrounding a variety of relatively long term climate records and the role they should have in informing public consciousness of what exactly is a (semi-) natural environment. Please see below for details of how to get involved organising the event.
Finally, the editor welcomes Pete Coxon back into the IQUA Chair and wishes him all the best in his second period of stewardship. I would also like to thank everyone who has contributed to the compilation of this newsletter. Don't forget: news items are welcome at any time of the year!

Stephen McCarron, NUIM, July. 2008

2. IQUA Committee, 2008/9

The IQUA Committee, following elections held at the AGM is currently as follows:
President: Prof. Pete Coxon, TCD
Secretary: Dr. Stephen McCarron, NUIM
Treasurer: Mr Michael Andrews
Postgrad rep: Gayle Mc Glynn, TCD
Website manager: Dr Robin Edwards, TCD.
Publications Secretary: Dr. Stephen McCarron, NUIM
Ordinary members: Donal Mullane, Dr Graeme Swindles (U. of Bradford)

3. IQUA/QRA Spring Field meeting
North of Ireland, 10-13th April, 2008

Thanks to the efforts of a QUB-led team headed up by Dr. Nicki Whitehouse, QUB, the QRA enjoyed a very successful, sun drenched visit to sites throughout the north of Ireland from 10-13th April, 2008. Co-ordinators of the four field days included Nicki, Helen Roe, Jasper Knight and myself.

Using Belfast as a base the day trips covered the Co. Down coastline, the Bann Valley lowlands, Strangford Lough and the Ards Peninsula, the Antrim glens and the north coast.

The pre-trip plenary lecture and reception was hosted by the 14Chronon Centre, Fitzwilliam St, Belfast and a talk by Prof. Mike Baillie proved highly entertaining, scientific and well received. A reception afterwards sponsored by Dunedin Academic Press ran alongside fascinating guided tours of the AMS ^{14}C dating laboratory in the centre kindly led by Paula and Ron Reimer.

The trip was attended by at most 30 participants, falling short of anticipated numbers but still allowing fruitful field discussions and enjoyable socialising in a very welcoming and hospitable city.

A field guide, running to 300 pages, (special thanks from IQUA to Nicki and Phil Barrett for its compilation) is now available from the IQUA publications secretary or the QRA.

IQUA owes a debt of thanks to Nicki, Helen, Jill, Paula, Phil, John and all the QUB group. Through the enormous amount of effort put into ensuring the trip's success, the group and their associates (notably Graeme and Jim) have demonstrated their

commitment to top quality research and the promotion of Ireland as a venue for excellent field meetings and scientific study.

Participants at The Giant's Ring, Ballynahatty, Co. Down (Photo credit: Helen Roe, QUB).

S.McCarron, July 2008

4. IQUA Spring Meeting and AGM 2008

The 2008 Spring Meeting and AGM took place on Sat. 5th April, in NUIM.

An abridged version of the draft Minutes follows:

IYPE. The chair reported that IQUA events were being run to tie in with IYPE. IQUA had sponsored some general IYPE activities to the sum of €500, and associated literature would bear the IQUA name and acknowledge this support.

INQUA congress. Several IQUA members attended the Cairns meeting. Jasper Knight proposed a drumlin symposium related event in the W. of Ireland. This is scheduled to go ahead in September 2008.

The joint bid to host the INQUA 2011 symposium narrowly failed. It will instead be held by a Swiss – Austrian collaboration.

There had been a dip in subscriptions, partly due to non-payment and partly due to previous up front payments for several years. All members were asked to contact the Treasurer to check on dues owing.

The Chair suggested this years Autumn Symposium should tie in with the IYPE – possible theme of Climate change: past, present and future, looking at how records from the past may inform the present / future

It was proposed the next AGM would be held on 29 March 2009, venue to decided.

The prize for the best postgraduate talk at the 2008 IQUA Spring meeting was shared between Claire McLoughlin (Maynooth) and Nick Owen (TCD) (see abstracts of Spring Meeting talks below).

The outgoing Chair (Steve McCarron) thanked all those involved in running IQUA activities during his time of office and wished the incoming Chair the best of good fortune in the role (again!).

5. IQUA 2008 Autumn Symposium

The 2008 IQUA Symposium is planned for Nov. 21st, 2008.

It is suggested this years Autumn Symposium should tie in with the concerns of the IYPE by examining the research and findings of Quaternary scientists in the area of Climate change i.e. how can records of the past help us understand the present and future.

A set of discrete sessions will look at how records from the past in a variety of research areas may inform how we interpret present environmental conditions and probable future ones.

Suggestions of sub-themes to be covered and nominations of possible speakers to be invited are welcomed by the organising committee, which includes: Stephen McCarron (NUIM), Robin Edwards (TCD) and Graeme Swindles (U. of Bradford).

Suggestions and comments please to:

Stephen.mccarron@nuim.ie or

edwardsr@tcd.ie or G.T.Swindles@Bradford.ac.uk

6. IQUA Spring Meeting, 5th April, 2008

Contributing abstracts:

Assemblages of foraminifera at the continental slope off Western Ireland – influence of variations in bottom current strength and positioning.

N.L. Owen1 (owensn@tcd.ie), L.T. Toms2, P.D.W. Haughton2, R.J. Edwards3, and P.M. Shannon2

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2 UCD School of Geological Sciences, University College Dublin, Belfield, Dublin 4
3 Department of Geography, Museum Building, Trinity College Dublin, Dublin 2

Slopes west of Porcupine Bank on the Irish Atlantic margin have been extensively sampled by gravity cores. This section was selected because it is relatively stable, is known to be / have been swept by northward flowing bottom-currents, and high resolution seismic profiling reveals that the section is plastered by thin contourite sheets. Four gravity cores have been examined in order to construct a downslope stratigraphy and assess variations in bottom current activity. Sedimentological evidence implies that enhanced bottom currents moved down slope during MIS 2 and peaked in velocity during MIS 3.

Stable isotope measurements (δ18O and δ13C) have been obtained from planktonic and benthic foraminifera preserved in gravity core 9/97/10 (1260m water depth) on the western flank of the Porcupine Bank. Alternation between colder and warmer climate episodes can clearly be identified and coincide with changes in texture and sediment composition. Variations in assemblages of benthic foraminifera appear to be primarily controlled by variations in organic matter flux, but a response to bottom currents (particularly by epifaunal taxa) is also apparent, particularly during MIS 3 interstadials.

Study of core 9/97/27/II (2756m water depth) has revealed an episode of enhanced productivity preceding Heinrich Event 4. During this interval, the abundance of benthic foraminifera is four times the maximum of any other in the core. The sedimentology of this core does not vary in-line with stadial-interstadial climate variations, as can clearly be observed at intermediate depths.

Iceberg keel marks on the Porcupine and Rockall Banks, NE Atlantic

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(3) Dpto. Geociencias Marinas, Facultad de Ciencias, University of Vigo, 36200-Vigo, Spain

Sinuous furrows and sub-circular craters interpreted as relict iceberg keel marks are examined across the Porcupine and Irish Rockall Banks, NE Atlantic, using Irish National Seabed Survey geophysical datasets (multibeam data and 3.5 kHz subbottom profiles). The keel marks are observed over a total area of c. 40,000 km^2 of the two banks, in water depths (WD) of c. 180-600 m; over 40,000 individual seabed features have been mapped. The widespread seafloor features record the keels of floating icebergs up to 450-500 m in draft that calved into the Atlantic Ocean from the last European and/or North American ice sheets. The furrows cover a broad spectrum of orientations, but over 1/3 lie in the range 270-310 (NNW- SSE); where the direction of scour can be inferred from the terminal pit, the most common orientation is NNW. On both the Porcupine and Rockall Banks, above c. 225 m WD the keel marks become shallower and shorter and the number of craters increases; they are not recognized above c. 180 m WD. Global sea level was up to 140 m lower at the last glacial maximum (LGM), so that the top of the Porcupine Bank (150 m WD) would have been near sea level and a larger area of the Rockall Bank would have been exposed. The lack of iceberg keel marks above present depths of c. 200 m may be due to smaller icebergs scouring harder seabed, as suggested by 3.5 kHz data and seabed samples, and/or erosion by currents. The distribution and orientations of the keel marks at greater depths are inferred to reflect the influence of ocean currents similar to those of the present moving along the flanks of the banks.

Northeast Atlantic glacial/interglacial changes in the marine carbonate system over the past 30 000 years

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Three NE Atlantic deep-sea cores, BOFS 8K (52°N 22°W), BOFS 5K (50°N 21°W) and NEAP 8K (59°N 23°W), were used to reconstruct the carbonate sedimentation history over the past 30,000 years. Climatic change over the last glacial-interglacial cycle is associated with dramatic changes in ocean circulation, the global carbonate system and the nature of the sediments deposited in the deep-sea. In the investigated cores, glacial and deglacial sediments are dominated by terrigenous IRD, whereas during the Holocene biogenous carbonate contributions, as well as their mass accumulation rates, increase significantly. This results from increased biological productivity as well as increased sediment focusing at the sites. Fine fraction (<38 µm) carbonate, and thus coccolith production and dissolution, drives most of the bulk carbonate changes and is the focus of this study. The proportion of foraminifera is increased during the LGM, whereas detrital carbonate dominates during Heinrich events. Distinct glacial-interglacial variability in carbonate preservation was revealed by a dissolution index using the ratio between Emiliania huxleyi, the dominating species, and that of etched or unidentifiable small placoliths under polarised light microscopy. Overall, placoliths are better preserved in the glacial sediments. Differences in carbonate dissolution are likely due to changes in deep water circulation as well as increased primary productivity during the Holocene.
A biometric study of E. huxleyi reveals increased coccolith sizes, a more circular coccolith shape and a bimodal distribution during the glacial period, especially during the LGM. This points to the existence of two E. huxleyi morphotypes (Type A and Type B; cf. Young and Westbroek, 1991), with a larger form dominating glacial sediments. This is consistent with previous results from the central Atlantic and Mediterranean Sea (Colmenero-Hidalgo et al., 2002). The abundance of either morphotype appears to be primarily controlled by sea surface temperature (SST), as previously suggested (Colmenero-Hidalgo et al., 2002; Hagino et al., 2005). The smaller Type A is depicted as a 'warm' water genotype, whereas the larger Type B characterizes cooler SST, which is consistent with its dominance during the LGM.

However, a strikingly similar pattern between calculated E. huxleyi placolith weights (cf. Young & Ziveri, 2000) and foraminifera shell weights (Barker et al., 2004) suggests that the carbonate chemistry of the surface ocean may also play a role. In NEAP 8K, increased foraminiferal shell weights during the LGM are believed to reflect elevated [CO32-] of surface waters due to lowered glacial atmospheric pCO2 (Barker et al., 2004).

Bibliographic References:

Barker, S., Elderfield, H. & Kiefer, T. 2004. Temporal changes in North Atlantic circulation constrained by planktonic foraminiferal shell weights, *Paleoceanography*, **19**, doi:10.1029/2004PA001004.

Colmenero-Hidalgo, E., Flores, J-A. & Sierro, F.J., 2002. Biometry of *Emiliania huxleyi* and its biostratigraphic significance in the Eastern North Atlantic Ocean and Western Mediterranean Sea in the last 20 000 years, *Mar. Micropaleontol*., **46**, 247-263.

Hagino, K., Okada, H. & Matsuoka, H., 2005. Coccolithophore assemblages and morphotypes of *Emiliana huxleyi* in the boundary zone between the cold Oyashio and warm Kuroshio currents off the coast of Japan, *Mar. Micropaleontol*., **55**, 19-47.

The distribution of glacial landforms and associated sedimentary units of the Gweedore region, Co.Donegal.

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The Gweedore region of Donegal can topographically be divided into two regions reflecting variations in the underlying geology. An east-west contrast exists where numerous quartzite mountains dominate the east while the west consists of gently undulating granodiorite terrain. Geographically this region is sited in a marginal sector of the last composite ice-sheet which covered the British Isles (McCabe, 1995). Evidence for ice sheet activity is apparent everywhere with continuous, steep-sided, round crested, well-defined ridges extending for 2-3km across the open-ended valley between Bloody Foreland (314m a.s.l.) and Tievealehid (429m a.s.l.). Small, gently undulating, irregular hummocky moraine topography rims the northern face of Tievealehid. Glacigenic sediments typically overlie bedrock which is occasionally deeply chemically weathered. Two lithofacies associations are recognisable. The first occurs as a thick apron of massive diamicton composed predominantly of meta-dolerite clasts. The second consists of cobble to pebble gravels that range from crudely stratified to chaotic in nature. In this paper, the abrupt change in textural composition and clast

assemblages between the two lithofacies associations reflecting changing ice dynamics and depositional environments in NW Donegal will be discussed.

Literature cited:
McCabe, A.M. (1995) Quaternary Geology. In Wilson, P. (Ed.) *IQUA Fieldguide: North-west Donegal*. Vol.19. Dublin: Irish Association for Quaternary Studies, 15-20.

The Pit and the Pedestal: Tales of the Unexpected

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Conventional wisdom maintains that erratic boulders, left stranded on bare limestone surfaces by retreating ice sheets, protect the limestone beneath them from dissolution by rainfall. Over time the surrounding limestone is lowered by dissolution to leave these erratics perched on pedestals. The height of such pedestals can provide a rough measure of surface lowering since the erratic was stranded, from which a regional post-Glacial surface lowering rate for limestone outcrops can be calculated. This is where theory and reality diverge...

Even across quite limited areas of limestone pavement pedestal heights may vary considerably, from tens of cm to nothing or even less than nothing. In some cases an erratic may even rest in a pit significantly below the surrounding surface. Observations at sites across western Ireland indicate that pedestal height, or lack of it, is controlled by several factors including erratic lithology and shape, exposure to prevailing weather, and proximity to lakes, walls or quarries. All of these factors must be considered before any erratic can be used to provide meaningful data on surface lowering rates.

Contexting a mesolithic platform crannog in Lough Kinale, Co. Longford

Nora Bermingham[1] & Ingelise Stuijts[2]

[1]*Archaeoenvironmental consultant & Hon. Research Fellow Institute of Archaeology, Univeristy of Birmngham*

[2]*Dr Ingelise Stuijts, the Discovery Programme*

The paper details the results of a gross stratigraphic survey of the area immediate to a Late Mesolithic crannóg located on the shore of Lough Kinale in the townland of Derragh, Co. Longford. This area has been the focus of investigation by Christina Fredengren, the Lake Settlement Project (LSP) of the Discovery Programme since 2002. Archaeological investigations at Derragh began in 2003 with additional seasons in 2004, 2005 and 2006. The excavations have uncovered evidence for occupation of the site in the Mesolithic and Early Neolithic and has retrieved thousands of flint aretfacts, wooden artefacts and worked wood.

In addition to archaeological excavation, a programme of high-resolution analyses of biostratigraphic records taken from a nearby raised bog and three crannóg sites has been completed by the Palaeoenvironmental Research Group from the University of Exeter and the Discovery Programme. A detailed picture of both regional and local environmental change in and around Lough Kinale is now available. Though these results are not the focus of this paper, they do provide a broader background picture.

As the archaeological excavations progressed, it was evident that a greater understanding of the crannog's immediate location was required and this could be best achieved by investigating the surrounding peat deposits and reconstructing, on a macro-scale, the environment in which the crannóg was located. This would allow better understanding of the crannóg's position in the landscape relative to Lough Kinale, the River Inny, the raised bog at Derragh and nearby areas of dryland. The survey might also help explain why this particular location was selected over other locations on the lake shore.

The survey consisted of two primary elements: (1) a conventional transect-based stratigraphic survey and (2) a high-density stratigraphic survey of the crannóg site to enable the creation of 3-D models of environmental change using ArcGIS. The survey identified that the crannog was located on top of a peat ridge, formed as result of channel migration of the River Inny. A palaeochannel, cut through earlier fen peat deposits was identified. The stratigraphy suggests the formation of the peat ridge, pre-dates the crannóg, possibly by several centuries, if not longer. The ridge, served as a higher, somewhat drier, location within a lakeside wooden fen. This contrasts with Frank Mitchell's description of Mesolithic occupation sites around Lough Derravaragh, located on seemingly isolated knolls of fen peat. Mitchell suggested that the sites only became isolated because of channels cut through the fen by the river Inny as it entered the lake.

It is likely that this project will be the subject of additional presentations in the future by members of the project team.

7. Notices

New Courses (Starting Sept. 2008)

MSc in Dating and Chronology at Queen's University Belfast.
School of Geography, Archaeology & Palaeoecology, Queen's University Belfast
For careers in Archaeology and Quaternary Science.

Theoretical and practical training in:
• AMS radiocarbon dating and calibration
• Dendrochronology
• Tephrochronology
• Biostratigraphy
• Material culture based dating techniques
• Chronology-building techniques

To apply, please contact:
Susanne Sneddon (details below) or Dr Chris Hunt (c.hunt@qub.ac.uk).
http://www.qub.ac.uk/gap/
Susanne Sneddon
Archaeology & Palaeoecology
School of Geography, Archaeology & Palaeoecology
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MSc. in Climate Change at the Department of Geography, NUI Maynooth.

The aim of the course is to provide graduates with the knowledge, skills and experience necessary to enable them to undertake analysis of both global and Irish related climate change science, impacts and policies.

Course objectives include:
1. To introduce students with a primary degree level background in climatology and/or related disciplines to current global climate change issues and implications.
2. To provide training in research methods appropriate for modelling future climates and their impacts.
3. To develop the capacity for undertaking independent research in the climate change area.
4. To provide a professional education in the area of climate change policy for those who need to be familiar with current developments for mitigating and adapting to future change.

Applications can be made online at http://graduatestudies.nuim.ie/prospective/index.shtml or by contacting Professor John Sweeney, Department of Geography, NUI Maynooth, Maynooth, Co. Kildare, Ireland. Tel: + 353 1 7083610 / email: geography.department@nuim.ie

New Research Projects

Cultivating societies: assessing the evidence for agriculture in Neolithic Ireland (INSTAR Project, Heritage Council)

Nicki Whitehouse (PI) (QUB), Rick Schulting (CO-I) (University of Oxford), Meriel McClatchie (Co-RF) (QUB), Amy Bogaard (Co-I) (University of Oxford) and Philip Barratt (RF) (QUB).

Project Partners: Graeme Warren and John O'Neill (UCD); Finbar McCormick, Paula Reimer, Dave Brown (QUB); Dáire O'Rouke (NRA); Finola O'Carroll (CRDS); Alison Sheridan (National Museums Scotland); Sue Colledge (University College London); Rob Marchant (University of York).

A defining characteristic of the Neolithic is the appearance of domesticated plants and animals. Due to a lack of publication in Ireland, surprisingly little is known about agricultural husbandry and consumption, its environmental context and how this might have varied across space and time.

This project will examine the extent, nature and timing of Neolithic farming in Ireland through the collation, integration and analysis of unpublished and published data (archaeobotanical, zoo-archaeological, palaeoecological, ^{14}C, stable isotope, and archaeological data) from the commercial, state and academic sectors. Integration of these varied lines of evidence is enabled by bringing together international researchers from a range of backgrounds. It will investigate relationships between economy, landscape and settlement against a wider palaeoenvironmental backdrop, and explore implications for the roles and perceived importance of ritual and domestic spheres during the Neolithic.

The project aims are as follows:
(1) establish a database of plant macro-remains from published and unpublished sources;
(2) directly date (AMS ^{14}C) cereal remains from selected sites;

(3) identify possible manuring and/or other management practices via stable isotope analyses of selected seed assemblages and analysis of weed assemblages;
(4) re-evaluate the Irish palaeoecological record for information on the environmental and landscape context of farming, via the Irish pollen database and other palaeoecological sources, such as bog surface wetness curves and dendrochronological data held at QUB, creating diagrams in space/time;
(5) collate existing published pastoral and human bone/dietary evidence;
(6) collate the available archaeological evidence for settlement and landscapes in Neolithic Ireland in the context of the above data.

These aims will allow us to:

(1) investigate the timing, nature and type (e.g. intensive/extensive) of Neolithic farming across different regions of Ireland;
(2) investigate any associations between varying farming strategies and different site-types (e.g. houses, pit complexes, ceremonial sites).
(3) examine effects on the landscape of these activities and relationships against wider environmental trends in Ireland and the North Atlantic region;
(4) investigate wider social implications regarding the transition and development of the Irish Neolithic, relationships between 'domestic' and 'ritual' spheres, and how farming practices may have contributed to the creation and maintenance of identities;
(5) compare the Irish evidence with that from Britain and the Continent.

These investigations will inform discussion of interactions between people and their landscapes, how landscapes changed over time, and how they may have been perceived.

Further information on the project may be found at:

http://www.chrono.qub.ac.uk/instar/

8. Recent Publications

Delaney, C. (2007) Seasonal controls on deposition of Late Devensian glaciolacustrine sediments, central Ireland. In, Hambrey, M.J., Christoffersen, P., Glasser, N.F., Hubbard, B. (eds.) Glacial Sedimentary Processes and Products. International Association of Sedimentologists Spec. Pub. No. 39, p. 149-163.

Knight, J. and Burningham, H. 2007. Coastal morphodynamics and prehistoric human occupation, County Donegal, NW Ireland. Journal of Coastal Research, Special Issue 50, 104-108.

Knight, J. 2008. The environmental significance of ventifacts: A critical review. Earth-Science Reviews, 86 (1-4), 89-105.

Knight, J. 2007. Beachrock reconsidered: Some comments on the paper by Kelletat, 2006. J. Coastal Res., 22 (6), 1558-1564. Journal of Coastal Research, 23 (4), 1074-1078.

Murphy, E.M. and Whitehouse, N.J. (eds.) 2007. Environmental Archaeology in Ireland. Oxford: Oxbow Books.

Plunkett, G., Carroll, F., Hartwell, B., Whitehouse, N. J. and Reimer, P.J. 2008. Vegetation history at the multi-period prehistoric complex at Ballynahatty, Co. Down, Northern Ireland. Journal of Archaeological Science, 35, 181-190.

Wilson, P., Bentley, M.J., Schnabel, C., Clark, R. & Xu, S. 2008. Stone run (block stream) formation in the Falkland Islands over several cold stages, deduced from cosmogenic isotope (10Be and 26Al) surface exposure dating. Journal of Quaternary Science 23, 461-473.

Wilson, P. 2008. Comment on Carr, S. and Coleman, C. (2007): "An improved technique for the reconstruction of former glacier mass-balance and dynamics", Geomorphology 92, 76-90. Geomorphology, 99, 443-444.

Whitehouse, N., Roe, H.M., McCarron, S. and Knight, J. (eds.) 2008. Field Guide to the north of Ireland, Quaternary Research Association, London. pp.300. (Limited copies available from IQUA, priced €25)

9. Recent PhD/Project completions

New Constraints on the Deglaciation of the Irish Ice Sheet from ^{10}Be and ^{36}Cl Dating.

Jorie Clark, School of Environmental Sciences, U. Ulster, N. Ireland.

DPhil Awarded Sept. 2007

New *in situ* cosmogenic nuclide ages have been obtained from moraines in northwestern, western, and northeastern Ireland. ^{10}Be ages from the Bloody Foreland moraine in northwestern Ireland constrain the age of initial deglaciation of the Irish Ice Sheet (IIS) from its last glacial maximum (LGM) position on the continental shelf to be 19.4 ± 0.3 ^{10}Be ka. These ages are in excellent agreement with calibrated ^{14}C ages that constrain retreat of the IIS margin from the continental shelf elsewhere in northwestern and western Ireland, suggesting widespread deglaciation of these margins of the IIS ~19.5-20 ka B.P. In western Ireland, the Tawnywaddyduff Moraine is a regional moraine system which extends from the north side of Clew Bay northeast to Donegal Bay. ^{10}Be dates from this system suggest that deglaciation from the Tawnywaddyduff Moraine occurred 15.6 ± 0.3 ^{10}Be ka (15.6 ± 1.0 ^{10}Be ka with external uncertainty). This age is in excellent agreement with the timing of deglaciation from the Irish Sea Basin ($\geq$15.3 ± 0.2 cal ka B.P.) at the end of the Killard Point Stadial. A prominent moraine system on the floor of Donegal Bay is correlative to the Tawnywaddyduff Moraine, indicating that the actual maximum extent of the readvance was several tens of km to the west of the coastal mountains. A reconstruction of the ice surface indicates that the IIS reached a maximum surface elevation of >500 m over the central Irish Lowlands during the Killard Point Stadial, suggesting a high sensitivity of the ice sheet to small changes in climate. The results from the ^{36}Cl dating of a moraine on Windy Gap in northeastern Ireland were only partly successful; consistent ages were obtained that suggest deposition of the moraine during the last deglaciation, but large errors resulted from apparent contamination problems during sample processing.

An understanding of Late Holocene woodland dynamics in southwestern and western Ireland through a study of sub-fossil insect remains

Eileen Reilly, Botany Department, University of Dublin, Trinity College

PhD awarded April 2008

The main aim of this research was to explore the validity of using sub-fossil insect remains as a proxy for reconstructing late Holocene woodland dynamics in southwestern and western Ireland. Three woodlands were examined and two types of deposit used, small hollow peat and mor humus. Pre-existing Holocene vegetational and documentary records were pre-requisites for site selection. Chronologies for the three sites were established using a combination of tephrochronology and radiocarbon dating. A number of questions were asked of the data with regard to woodland openness, climate signals and changing biodiversity.

Results showed that sub-fossil insect analysis was a successful proxy for understanding forest structure during the Late Holocene, proving more discerning than pollen analysis in identifying changes at the forest floor, particularly hydrological changes and fluctuating accumulations of dead wood. However, differentiating between the drivers of canopy openness was not always possible. The availability of pollen and documentary records proved critical in attempting to disentangle these factors, suggesting that a multi-proxy approach is vital for understanding the structure of Holocene woodlands.

Ordination of the data showed the convergence of mor humus and small hollow insect assemblages in one site, suggesting that chosen sampling location size and sediment matrix is critical to successful integration of the insect records from these different deposits.

Tephrochronology proved vital in understanding sedimentary records in the small hollow but was less successful in the mor humus deposits. Six layers were detected and four were identified to known tephra horizons regularly recorded in Ireland while two new tephras of Jan Mayen and Grimsvotn origin were recorded. The latter tephra, in particular, appears to be the first record of Laki 1783-4 from Ireland and is potentially an important new chronological marker for Irish palaeoecological investigations of late Holocene deposits.

Climate signals in the data were not clearly identified. In general, human activity, both direct and indirect (through catalyzing other disturbance factors) appeared to have exerted the greatest influence on the insect assemblages, thereby masking or confusing any underlying climate signals.
Finally, the beetle assemblages of past and present woodlands showed marked differences, most notably the increasingly impoverished dead wood element of the fauna to the present day. It suggests that modern woodlands, regardless of their perceived age or 'naturalness', are not a direct analogue for ancient woodland and that habitat requirements of woodland insect fauna need to be considered more carefully by woodland managers to halt continued loss of this critical element of the forest ecosystem.

Quaternary Geology map of County Dublin at 1 to 50,000 scale

The Quaternary Geology of County Dublin has been addressed in the past by Lamplugh et al (1903) in Dublin City and by Hoare (1972) in the rural areas. However, the production of a seamless map covering the entire county was essential.

The Geological Survey of Ireland (GSI) undertook, during the second half of 2005, a Quaternary Geology compilation map for County Dublin derived from historical and borehole data. This was followed by a quaternary geology mapping program to the reconnaissance standard of the GSI, carried out between mid 2006 and June 2008.

Two comprehensive digital datasets have been derived from this exercise, Depth to Bedrock and the Quaternary Geology maps of County Dublin. Both of which will be freely downloadable from the GSI website (www.gsi.ie).

The Quaternary Geology Map displays the dominant sediment type within 1m of the surface, a description of Quaternary sediments at specific sites, the distribution and outline of the main geomorphological features and ice flow directional indicators. Diamictons and glaciofluvial sediments derived from both onshore and Irish Sea ice are the main Quaternary sediments occurring in the area.

The depth to bedrock is a prediction map result of an interpolation exercise by means of the kriging geostatistical method. The average drift thickness has been estimated at 4.65m, reaching maxima of 45m in the Dublin Port area.

Xavier M. Pellicer
Quaternary Section, Geological Survey of Ireland

9. Forthcoming Workshops Seminars & Conferences

Geological Society of London and SEPM Paleogeography: The spatial context for understanding the evolution of the earth system.
August 10-13, 2008, St Johns College, Cambridge, Details at
http://www.geolsoc.org.uk/gsl/gsl/events/listings/page2856.html

QRA Short field Meeting, Glen Roy and adjacent areas, 8-11th Sept., 2008
www.qra.org.uk **or John Lowe (j.lowe@rhul.ac.uk)**

QRA Postgraduate symposium, 19-22th August, 2008
pcwww.liv.ac.uk/~qra2008/

IQUA Annual Symposium,
GSI, Beggar's Bush, November, 21st 2008
http://www.tcd.ie/Geography/IQUA/Meet/Met_Hme.htm

QRA Annual Discussion Meeting, Te Human dimension in rapid Environmental change, 5-7th Jan., 2009.
www.qra.org.uk

VII International Drumlin Symposium, 22-26 March 2009
Venue: Westport, Co Mayo

Weblink and more details to follow via the IQUA E-mail listserver, or contact Jasper Knight (j.knight@exeter.ac.uk).

10. General Membership Items

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S. McCarron, IQUA-L Moderator

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