



Editor: Catherine Dalton

1. Introduction

Dear All,

Welcome to IQUA newsletter No. 37 in its new summer distribution time slot. This newsletter includes abstracts from the very successful 2006 Spring meeting and AGM hosted by Queens University Belfast. The next spring meeting will be based in Limerick (provisional dates are Friday 2nd or Saturday 3rd March 2007).

Planning is in progress for the upcoming autumn IQUA symposium. The IQUA committee are pleased to announce that two postgraduate prizes will be awarded at this meeting.

Recent developments in the Royal Academy committees for Geoscience and Geography include: Garth Earls (Geological Survey Northern Ireland) has taken over as Chair of the Academy Committee for Geosciences, until the end of the Committee's term in May 2008; The Geological Survey of Ireland will establish an International Year of Planet Earth (IYPE) National Committee for Ireland over the next few months. This National Committee will propose, coordinate and promote activities in Ireland under the IYPE banner. Its members will be drawn from the Geosciences, Geography and Climate Committees, and other relevant organisations (e.g. IGA, IAH, IGI etc.)

Catherine Dalton

2. IQUA Fieldmeeting 2006

At the last IQUA AGM it was agreed that the 2006 autumn field meeting would be based near Belfast and would explore the landscape surrounding

Lough Neagh and the Sperrins. The field meeting is currently being organised by Graeme Swindles and Julian Carolan (Queens University Belfast). Preliminary plans include a visit to the Lough Neagh region, archaeology in and around Belfast with particular emphasis on the Giants Ring, bog site visits looking at reconstruction of bog hydrology and the use of bog oaks as records of palaeoclimatic change, possible visit to the diatomite sections near Toome and a very interesting sounding urban walk with a Quaternary theme.

3. IQUA Symposium 2006

A broad theme on 'Caves, Cave deposits and Related research' has been adopted for the Autumn symposium which is being organised by Mike Simms (Ulster Museum). Topics may include, among others: speleothems; faunal remains in cave deposits; interglacial records from Ireland; archaeology & rock art; karst & related processes. The symposium will be held in its traditional venue of the GSI in Beggars Bush. The provisional date for the symposium is November 24th and this will be confirmed via an email to the IQUA list. Mike is interested in hearing from anyone who would like to contribute to papers on these topics.

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New IQUA postgraduate Prizes to be awarded

- 1) the best Spring Meeting talk by a postgraduate member of IQUA;
- 2) The best publication by a postgraduate member of IQUA (as listed in the IQUA newsletter).

4. Abstracts from the IQUA Spring Meeting & AGM 2006



Oral Presentations

Age determination and stratigraphical correlation of saltmarsh sediments: the potential of pollen analysis.

A case study from Connecticut, USA.

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Saltmarshes hold considerable potential for reconstructing sea-level changes during the last few thousand years and offer a direct basis for comparing measured sea-level observations (e.g., from tide gauges) with those of the recent geological past. However, dating recent saltmarsh sediments, particularly via radiocarbon methodologies, can be problematic, particularly for the last ca. 200-300 years. This paper details the findings of a study aimed at evaluating the use of historically-delimited pollen 'markers', for dating recent saltmarsh sediments. The study focuses on a saltmarsh, Menunketesuck River Marsh (MRM) in Connecticut, New England which was chosen because i) it is located in an area with a well documented local history of landscape and vegetation change; ii) the organic character of the sediments has resulted in excellent pollen preservation; iii) prior investigations have shown that the marsh is a particularly sensitive recording site for the study of RSL change. Pollen was investigated from four closely (8 – 58 m) spaced cores in a sheltered area of the marsh, approximately 1.5 km from the coast. Careful analysis of local historical documents pertaining both to land use and forest change have enabled the ages of nine palynological and other 'markers' to be constrained. These include: 1) a decline in birch pollen dating from the 1940's-1950's; 2) a chestnut pollen decline dated at ca. 1915; 3) an expansion in 'opaque spheres' which probably reflects the development of two local towns or the expansion of the local railroad during the latter quarter of the nineteenth century; 4) a decline in *Quercus* pollen associated with the extensive felling of timber in the Menunketesuck River and adjacent catchments in the early to mid nineteenth century; and 5) an initial rise in *Ambrosia*

(ragweed) pollen and pollen of other ruderals (e.g., *Rumex*) resulting from land clearance in the mid eighteenth century.

To shed further light on the taphonomy of pollen in the marsh environment and hence aid in the interpretation of the fossil datasets, pollen samples were also collected from three surface transects from MRM. The analyses have shown that regional pollen taxa have a reasonably even distribution across the contemporary marsh surface, although some pollen grains are consistently over-represented in deposits near the upland border, whilst bissacchate grains (e.g. *Pinus*) show localised over-representation in creek sediments. This clearly has implications for interpreting the fossil assemblages.

The study has confirmed that historically defined pollen markers hold considerable potential for dating the highly peaty saltmarsh sediments of New England, confirming observations made previously in the region. In contrast to previous studies, this study has highlighted the need to obtain local, catchment-specific historical data to improve the accuracy of the age determinations. The study has also shown that through the analysis of multiple cores, pollen markers can be used to construct isochrons (timelines) for a single marsh site. They thus provide an excellent framework for i) establishing local marsh accretion rates; ii) examining temporal changes in microfossil (e.g., diatom) distribution which are integral to the study of sea-level change; and iii) independent cross-validation of AMS radiocarbon and Lead-210 datasets.

A limpet's-eye view of post-glacial isostasy

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The '25 Foot Raised Beach' in Northern Ireland represents a brief period when post-glacial eustasy and isostasy were rising at the same rate. However, it is difficult to pinpoint exactly where relative sea level was at the time of formation, or indeed the date of formation itself. At Portmuck, Co. Antrim, resting marks of Limpets (*Patella*) have been observed c. 10 metres above LWM on cliffs of Ulster White Limestone. The vertical zonation of modern limpets relative to HWM and LWM has been well documented by marine biologists. Hence these sub-fossil limpet marks may help define upper and lower tidal limits during raised beach formation. Fissures in the cliff, at roughly the height of the limpet marks, contain

sub-fossil shells of Limpets (*Patella*) and an associated fauna of Winkles (*Littorina*), Dog Whelks (*Nucellus*) and encrusting annelids (*Spirorbis*). Despite difficulties associated with interpretation of carbon-dates from marine shells, it is hoped analysis of elements of the fauna, particularly *Nucellus* and *Spirorbis*, may help constrain the time of formation of the '25 Foot Raised Beach'. Although previous attempts to date the raised beach have used marine shells, none have been from a context where they are so intimately associated with the level at which they lived.

An evaluation of the last glacial-deglacial cycle and evidence for lower than present sea levels, Clew Bay, Ireland.

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Terrestrial and shallow marine environments within the formerly glaciated, bathymetrically complex Clew Bay were mapped using a combination of: DEM's, aerial photography, digital bathymetry, 235km of high-resolution (2-10kHz, 4 pulses/second) FM Chirp sub-bottom reflection profiles and 175km² of Laser Airborne Depth Soundings (LADS). Data were integrated within a GIS platform to facilitate a holistic approach to the reconstruction of Late-Quaternary environments of Clew Bay.

Key objectives were: (1) to evaluate the last glacial-deglacial cycle; (2) to reconstruct the coastal/geomorphological evolution of the bay during the post-glacial sea-level rise; and (3) to document spatial and temporal domains of palaeoenvironmental evolution.

Major submarine features include: (1) three geographically distinct hummocky moraines, which are tentatively correlated with terrestrial counterparts and (2) a series of morphologically variable bathymetric highs, which are identified as erosional remnants of subglacial bedforms in various stages of preservation. Within the shallow sub-surface an acoustically distinct area of relict glaciogenic features including scoured V-notch, kettle hole with subglacial meltwater deposits and ridge and groove morphology are interpreted as recording temporal and spatially distinct phases of ice margin activity. The general distribution and orientation of the features is consistent with regional ice flow indicators and are diagnostic of a highly dynamic environment. Detailed analysis of subglacial bedforms suggests that the majority of terrestrially-based bedforms are Rogen moraines and not drumlins as previously assumed. A statistically significant secondary phase of

overprinting is suggested from the orientation and morphometry of these features.

Six distinct spatial and temporal domains of geomorphologic evolution are recognised within the study area, which agree with the generally accepted stratigraphic development along the west coast of Ireland and large sectors of the British Isles, in terms of the last glacial-deglacial cycle and subsequent marine transgression.

Proposed conceptual models of coastal evolution during the Holocene transgression suggest a spatial and temporal combination of -34m lowstand at 9000 yrs B.P., shoreface transition to lagoon and open marine conditions prior to the development of drowned barrier-beach complexes and back-stepping barrier island systems, resembling the contemporary coastal morphological expression at approximately 7500 yrs B.P.

Saltmarsh microfossils as a tool for reconstructing Holocene relative sea-level change: applications in Ulster.

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Ulster, in the north of Ireland, has a poorly reconstructed Quaternary relative sea-level (RSL) history, with that of the late Holocene predominantly unknown. The limited RSL record of the last 3 ka in particular affects understanding of RSL trends in the Ulster region. This is of especial importance in predicting and planning for RSL changes in the near future, as well as for understanding the deglacial history of the north of Ireland.

The Holocene relative sea-level (RSL) history of Ulster remains poorly understood, yet the RSL archive of this region holds great potential for understanding patterns of deglaciation and residual isostatic trends. A range of coastal sediments have been used as a basis for RSL reconstruction, yet saltmarshes remain a source of data not yet exploited in this region. Saltmarsh microfossils, particularly foraminifera and diatoms, have proven to provide high-resolution and accurate data on late Holocene RSL change when used to develop and apply transfer functions in areas including Great Britain and North America. This research utilises the principle of uniformitarianism, assuming that current processes driving assemblage content are the same of those in the past, when fossil assemblages were created.

Contemporary microfossil and associated environmental data are presented from three Ulster saltmarshes (Dorn and Cullintra in Strangford Lough and Maas in western County Donegal). These analyses suggest that both foraminifera and diatom assemblages are most significantly related to elevation above tidal level. Thus, the contemporary data is suitable for developing an altitudinal-based transfer function to reconstruct palaeo-RSL from several sites around the north of Ireland. However, a large amount of variance remains unexplained (69% of foraminiferal variance and 73% of diatom variance). This implies that future research is necessary to refine the technique in terms of its applicability in the region.

Cosmogenic Isotope Surface Exposure Dating – some recent applications

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Cosmic radiation bombards the surface of the Earth and interacts with target elements in minerals to produce cosmogenic isotopes. Measurement of these isotope amounts can provide estimates of the exposure age of the surface under investigation. Although the technique has been in use for over 20 years, recent technological advances and greater understanding of isotope production rates has resulted in many more applications of the method particularly with respect to Quaternary landform genesis. Quaternary scientists now have a technique available that allows them to establish the exposure age of landforms that were previously impossible (or extremely difficult) to date by direct means.

Recent applications of the technique have included the dating of ice-marginal moraines, alluvial river terraces, fans and debris flows, shorelines and shoreline deposits, rock-slope failures, cave sediments, fault scarps, meteorite impacts, and volcanic landforms. Papers by Gosse & Phillips (2001), Phillips (2001) and Cockburn & Summerfield (2004) provide excellent introductions to the technique and range of applications.

Cosmogenic isotope exposure ages have been reported from moraines at a range of sites in Ireland (Bowen *et al.*, 2002), and other, as yet unpublished, dates have been obtained from glacial contexts at Blessington, Aran Islands, and the Mourne (by Eric Colhoun) and Macgillycuddy's Reeks (by Stephan Harrison). These ages are providing significant insights into

the glacial history of the country during the last 80 ka.

Applications and implications of surface exposure dating to Falkland Islands blockstreams, erratic boulders in the Yorkshire Dales, and rock slope-failure deposits in Ireland and the Lake District will be discussed – although I can't promise too many actual ages!

References

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Late Quaternary vegetation change in Sarawak

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The sequence of vegetation change in the Island of Borneo is very poorly known, with virtually no information available for Sarawak. In this paper, recent palynological research in Sarawak is described. The Late Quaternary was a time of enormous vegetational change in Borneo, with rainforest replaced during cold stages by a shifting mosaic of dryland forest, montane forest and steppe. Human intervention in the vegetation is marked from before 50 ka.

One thousand years of weather extremes in Ireland: The record of the Irish Annals.

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This paper presents evidence relating to the frequency of weather extremes and associated natural hazards in Ireland from c.600 – 1600 A.D. This evidence is drawn from a remarkable, yet neglected, documentary source of past climatic and weather information, known widely as the Irish annals. In essence, the annals are yearly listings of important ecclesiastical and secular events, originally maintained in religious settlements around the country, and include reports of the

founding of churches and obits of notable persons. Also recorded are events such as great storms, droughts, and floods, along with a host of information from which climate conditions may be inferred, such as harvest failures and reports of abundant fruit. The paper will present examples of the information contained in the annals and address some of the issues particular to the proper usage of these sources, and documentary sources in general. The record of weather extremes in one major set, *The Annals of the Four Masters*, will also be examined, and some comment made on what the annals can tell us in terms of changes in Ireland's past climate.

“An Abundance of Mast”: Problems with climatic reconstruction in Early Christian Ireland.

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There appears to have been a major shift in the fundamental basis of Irish society during the 9th and early 10th centuries which is reflected by a change in site-type and the farming economy. This paper will examine the possibilities of using various proxies – documentary sources; archaeological data; and palaeoenvironmental findings – to attempt a reconstruction of the climate in Ireland in the 9th century, thereby testing whether climatic change may, in part, have been responsible for this.

Palaeohydrological reconstructions from the Lough Neagh floodplains, Northern Ireland: evidence from peat stratigraphy, pollen and fossil beetle records

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Lough Neagh is the largest lake in Ireland and Britain, with a surface area of 383 km² and a catchment of 4,453 km². Its sole outlet is at Toome, via the Lower River Bann, where substantial diatomite deposits signify the existence of higher lake-levels during the Holocene. Research in the early 20th century suggested that diatomite began to accumulate since the end of the Boreal period (c. 6000 cal. BC) but the precise chronology is poorly established. The construction of a new road at

Toome provided access to previously unstudied floodplain sequences in the area. Borehole logs recorded along the length of the proposed road reveal what appear to be deep palaeochannels infilled with peat. Here we present the results of a multi-proxy (stratigraphy, palynology, Coleoptera) investigation of these peats, with chronological control provided by tephra and radiocarbon dating. We find that the highly complex stratigraphy of the area is the result of several periods of hydrological change in the fluvio-lacustrine system through the Holocene. The biotic data reveal a diverse floodplain environment no longer evident in the area.

Tree rings and environmental reconstruction: new work from the Lough Neagh region

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There is continuing interest in the use of annually resolved palaeoenvironmental records to understand past climate dynamics and resolve environmental events. The Irish bog-oak record is one of the most detailed palaeoenvironmental dataset available from the Atlantic coastal region of Europe and is thus an important proxy resource. Research currently underway is testing the sensitivity of this mid-Holocene tree-ring record to climatically forced environmental change in the North Atlantic. Newly extended bog-oak chronologies from Ballymacombs More, a raised bog on the Lower Bann floodplain, reveal significant inter-site differences as well as similarities in the tree-ring and population record when compared with data from existing sites. This indicates that the marginal environments on which the trees grew had significantly differing internal dynamics and complex responses to external changes. Several periods show cyclical responses in tree-growth that appear at centennial scales indicating common perturbations dominated by hydrologic forcing.

A multi-proxy investigation to test the cause of the decline of *Sphagnum imbricatum* at Dead Island bog, Co. Derry.

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Sphagnum imbricatum was once a dominant part of the plant ecology of many peatlands in NW Europe. A number of researchers have remarked on the disappearance of the abundant subfossil remains of this species from peat profiles. Despite this, there have only been a small number of studies that have focused on the palaeoecology of *S. imbricatum* in Irish peatlands. A marked decline of *S. imbricatum* is recorded in a plant macrofossil record from Dead Island bog, County Derry. This change is bracketed by the AD 860 and Hekla 1510 tephra layers and an interpolated date of c. AD 1000 is inferred for the decline, which is similar to numerous sites in Northern England. A multiproxy record, based on testate amoebae, humification, charcoal and loss-on-ignition analyses is used to empirically test the cause of the decline. Possibilities for this major palaeoecological change at Dead Island are elucidated including i) climatic change; ii) direct damage of the peatland through anthropogenic activity; iii) airborne eutrophication of the bog; iv) direct ecological competition from other *Sphagnum* species.

The multiproxy approach illustrates the difficulty in assigning one specific cause to the decline of *S. imbricatum* and a response to multiple factors is hypothesised.

Multi-proxy high-resolution record from Ballyduff Bog, Ireland, reflecting hydrological and climate changes during the last 4700 years

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Hydrology and ecology of a raised bog, Ballyduff in central Ireland, is reconstructed based on plant macrofossil, peat humification and testate amoebae analyses. A 5 metres long peat core has been studied at c. 4 cm intervals for the last 4700 cal BP years. Additionally, three focus periods of recognised rapid climate changes (between 4500-4000 cal BP, 2950-2450 cal BP and 1150-150 cal BP) have been analysed every 1-2 cm. 30 AMS radiocarbon dates have been used in wiggle-match calibration of the chronology. The top of the core has been dated using bomb peak radiocarbon and SCP techniques. This study is a part of an EU-funded project ACCROTELM.

The three proxies show a good level of agreement. Testate amoebae appear usually react first to hydrological changes while mire plants respond more slowly. Some plants (e.g. *Sphagnum imbricatum*) also exhibit wide

hydrological tolerance that may mask the changes in water levels. Humification is partly dependant on the plant composition, but comparison with other climate proxies (like speleothem data) suggests that some of the reactions of the humification curve directly reflect changes in temperature rather than surface moisture.

The Atlantic climate indicator, *Sphagnum imbricatum*, is the dominant plant species of Ballyduff from c. 4530 to 670 cal BP. Previously *S. Sect. Acutifolia* and *Dicranum* are more common. *S. cuspidatum* dominates during the later wet stages. After the latest wet stage, *S. imbricatum* does not recover as before, but is replaced by *S. papillosum* at c. 45 cal BP. This may suggest that the conditions became as dry as before 4530 cal BP, possibly a combined effect of warmer climate and dropping water levels due to peat cutting.

Major wet shifts distinguished in three proxies are: in two stages at ca. 4180 and 3930 cal BP, a short-lived at c. 1930 cal BP, and two especially well profiled at ca. 1480 and 740 cal BP. Major dry shifts begin at c. 3460, 1820, 960 and 150 cal BP. Most of these shifts can be connected with cooler and warmer periods recorded in western Europe and elsewhere, such as the 4200 cal BP cooling event, the Medieval warm period, the Little Ice Age and subsequent warming.

More information on the ACCROTELM project can be found at: www2.glos.ac.uk/accrotelm

Poster Presentations

The ecology and native status of pine (*Pinus sylvestris* L.) in Ireland

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Research to determine the native status of *Pinus sylvestris* in Ireland has so far produced ambiguous results. *P. sylvestris* is included in the Native Woodland Scheme, which is administered by the Forest Service and provides grant aid to landowners to plant native trees of local provenance, so it is being widely planted in semi-natural habitats in Ireland. However, the ecological value of these plantations has not been determined. Definitive information on the native status and ecology of the species is therefore urgently required.

This interdisciplinary PhD project combines palaeoecological and contemporary ecological techniques. The aims of the project are to review existing palaeoecological data and

augment it with new data, in order to test the hypothesis that native *P. sylvestris* still exists in Ireland, and also to describe the ecology and biodiversity of contemporary *P. sylvestris* communities in Ireland.

Palynological evidence indicates that *P. sylvestris* recolonised Ireland c. 9500 BP, flourished in upland and western areas and on peatland fringes, and then began to decline c. 4000 BP. The most recent specimen, a preserved stump from Clonsast Bog in County Offaly, was dated to $1,620 \pm 130$ BP. *P. sylvestris* is generally thought to have become extinct in Ireland at this point. Inconsistencies exist, however, between the palaeoecological and literary evidence, which suggests that *P. sylvestris* survived until later medieval times. New research questions the methods by which local presence of *P. sylvestris* is determined. This provokes the question: did *P. sylvestris* become totally extinct in Ireland or survive in isolated refugia? It survived in Scotland, where it still dominates considerable areas of the Highlands. *P. sylvestris* was reintroduced to Ireland from Scotland c.1700 AD and has been widely planted.

P. sylvestris is known to be an opportunistic species with broad climatic and edaphic tolerances. However, neither the autecology of the species nor the biodiversity of *P. sylvestris* stands have been systematically studied in the Irish context.

Putative native, naturalised and planted stands of *P. sylvestris* have been selected. The continuity, dynamics, fire history and chronology of putative native stands will be investigated through fine spatial resolution pollen, stomatal and charcoal analyses and radiocarbon dating. The stand structure, regeneration, vegetation and soil characteristics of all sites will be examined. Irish and Scottish data will be compared.

Supervisors: Dr Fraser Mitchell & Dr Steve Waldren
Funded by: IRCSET Embark Initiative Postgraduate Scholarship

Forest Clearance at the Mesolithic-Neolithic Transition around the Irish Sea Basin

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The transition period from the Mesolithic to the Neolithic was marked by fundamental cultural and lifestyle changes, which should be indicated clearly in the environmental records of the period. Changes around food procurement, linked to the adoption of cereal cultivation, led to significant changes in land-use and the environment

(Williams 1989). Radiocarbon dating of the latest Mesolithic and earliest Neolithic sites shows significant temporal overlap (Zvelebil and Rowley-Conwy 1986), which is also highlighted in the domestication of plants and animals (Zvelebil 1994).

This period has been linked to forest clearances prior to and including the elm decline, and raised interest in the development of early agriculture. The main indication of cultivation within woodland phases between c. 6,000 and 5,600 14 C years B.P. has been the presence of cereal pollen (Innes *et al.* 2003). This is closely linked with the presence of forest clearance species and charcoal.

This project aims to test the applicability of the forest-farming model of Goransson using pollen, charcoal and fungal spores, by comparing currently lightly grazed and cleared sites with those from the Mesolithic period situated around the Irish Sea Basin. It attempts to see if the changes are consistent with the forest farming model, rather than with forest clearance or natural change.

5. Notices

SFI Embark PhD scholarship

Dr S McCarron and Ms Claire McLoughlin have secured an SFI Embark PhD scholarship. Claire will start her PhD in Irish Quaternary geology in the forthcoming Academic year at NUI Maynooth.



Royal Irish Academy Lecture – Andy Knoll

Professor Andy Knoll of Harvard University will give an Academy lecture on Thursday, 9th November 2006. The lecture will probably be run in conjunction with the Irish Times and held in Trinity College. The title of Professor Knoll's lecture has not yet been finalised but the topic is likely to be 'Mars and life'.



Exposures Database

The attention of IQUA members is drawn to the exposures database that has been set up by the GSI.

http://www.gsi.ie/workgsi/bedrock/projects/tempexp/Temp_Exp_Form.htm

Members can also send information/pictures of recent exposures for posting on the IQUA website <http://www.tcd.ie/Geography/IQUA/Info/Exposures.htm>



The United Nations General Assembly has now formally approved the International Year of Planet Earth (IYPE). The 'Year' will consist of the years 2007, 2008 and 2009. The aim is to highlight the importance of geoscience in today's world and will feature both scientific research and public outreach activities.

The Geological Survey of Ireland is in the process of establishing a IYPE National Committee for Ireland over the next few months. This National Committee will propose, coordinate and promote activities in Ireland under the IYPE banner. Some of its members will be drawn from the Geosciences Committee, and from other Academy committees.

The International Year will support research projects within the following eight broad themes (Groundwater; Hazards; Earth & Health; Climate; Resources; Megacities; Deep Earth; Ocean and Soil. Downloadable brochures available on: <http://www.yearofplanetearth.org/downloads.htm>

6. Recent Publications

Ireland-related Publications:

- Ballantyne, C.K., McCarroll, D. & Stone, J.O., 2006, Vertical dimensions and age of the Wicklow Mountains ice dome, Eastern Ireland, and implications for the extent of the last Irish ice sheet. *Quaternary Science Reviews*.
- Clark, J., McCabe, A.M. et al., 2006, New constraints on the deglaciation of the western margin of the British-Irish Ice Sheet, Ireland, from ^{10}Be dating. *Geophysical Research Abstracts*, 8, 10272. (Abs.)

- Diefendorf, A.F. et al., 2006, Evidence for high-frequency late Glacial to mid-Holocene (16,800-5500 cal yr B.P.) climate variability from oxygen isotope values of Lough Inchiquin, Ireland *Quaternary Research*, 65, 78-86.
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- Knight, J. 2005. Controls on the formation of coastal ventifacts. *Geomorphology*, 64 (3-4), 243-254.
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- Knight, J. 2006. Geomorphic evidence for active and inactive phases of late Devensian ice in north-central Ireland. *Geomorphology*, 75 (1-2), 4-19.
- McCabe, A.M. et al., 2006. Chronology of the last glaciation of the British-Irish Ice Sheet"; *Geophysical Research Abstracts*, 8, 10270. (Abs.)
- McDowell, J.L., Knight, J. and Quinn, R. 2005. High resolution geophysical investigations seaward of the Bann estuary, Northern Ireland coast. In: FitzGerald, D.M. and Knight, J. (eds) *High Resolution Morphodynamics and Sedimentary Evolution of Estuaries*. Springer, Dordrecht, 11-31.
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- Turney, C.S.M., K. van den Burg, S. Wastegård, S.M. Davies, Whitehouse N.J., J.R. Pilcher and C. Callaghan 2006. North European last glacial-interglacial transitions (LGIT; 15-9 ka) tephrochronology: extended limits and new events. *Journal of Quaternary Science* 21(4), 335-345.
- Whitehouse, N.J. 2006, in press. A history of the Holocene British and Irish ancient woodland beetle fauna inferred from fossil remains: implications for woodland history, biodiversity and faunal colonisation. *Quaternary Science Reviews* (available on line)

International Publications:

- Dunlop, P. and Clark, C.D. (2006) The distribution of ribbed moraine in the Lac Naococane region, central Quebec, Canada, *Journal of Maps*, pp 56-67.
- FitzGerald, D.M. and Knight, J. (eds) 2005. *High Resolution Morphodynamics and Sedimentary*

Evolution of Estuaries. Springer, Dordrecht. ISBN 1-4020-3295-1, 364 pp.

Knight, J. 2005. Formation of thrust structures in front of coastal landslides. *Journal of Geology*, 113 (1) 107-114.

Knight, J. 2005. Processes of soft-sediment clast formation in the intertidal zone. *Sedimentary Geology*, 181 (3-4), 207-214.

Knight, J. 2005. Regional climatic versus local controls on periglacial slope deposition: a case study from west Cornwall. *Geoscience in south-west England*, 11, 151-157.

Irish Geology Week

During Irish Geology Week

(<http://www.gsi.ie/activities/forthcoming/geologywk2006/geologywk2006.htm>) several events of interest to Quaternary scientists were run, including "Exploring the eskers and related landforms at Knockbarron, Co Offaly - a guided Geowalk" led by Dr John Feehan; "Watch out for icebergs!" Dr Ian Enlander at Killard Point, Co. Down; and "The Quaternary sediment section at Shankill beach" by S.McCarron.

7. News items



INQUA 2011 Bid

Dr S McCarron (NUIM) has been asked to represent the Irish Quaternary research community on a committee established to prepare a bid to bring the INQUA 2011 Congress to the British Isles. The Congress is the largest global Quaternary Science meeting (1000+ delegates), and would be a prestigious and important showcase for Irish Quaternary research. The bid organising committee will be responsible for preparation of an intended congress programme and the planning of several pre- and post-Congress field meetings.

Steve welcomes any expressions of interest from IQUA members to run or participate in any such events, or indeed ideas for research areas to be included on the programme. It is hoped that full engagement by the Irish community will allow the organisation of several possible trips in Ireland (including research lab visits). The trips can commonly extend for 5-10 days and are a highlight of every Congress.

The bid will be led by Prof. John Lowe (Royal Holloway University of London; Chairman, QRA). The location of the 2011 congress will be voted on at the next Congress, to be held in Cairns, Australia in July 2007. This may well be a 'chance in a lifetime' opportunity to host the Congress so close to home, and thus allow many Irish Quaternary Scientists to attend.

IQUA members will be kept regularly informed of the bid's progress.

Steve McCarron

Many more events of interest filled a busy schedule, and IQUA's thanks are extended to Dr. Matthew Parkes for his organisational efforts. IQUA Members are encouraged to look out for and attend next years Irish geology Week events, usually run in April/May.

Itrax® X-Ray Fluorescence core scanner

This is to announce that the Itrax® X-Ray Fluorescence core scanner at Aberystwyth is available to academic, research and commercial users worldwide.

The Itrax provides very high-resolution, non-destructive elemental analysis of sediment cores in a few hours. Density and colour information is provided through X-radiography and digital RGB optical imagery. Scan resolution can be set to 200 µm intervals, providing element concentrations in the range Al - U within 10-18 hours for a 1 m sediment core. The effective XRF spot size is 0.2 x 4mm. Data evaluation, analysis and plotting is carried out with dedicated software, or can be output in spreadsheet formats. Soil cores, peat, speleothems, wood, rock samples, and archaeological artefacts may also be analysed.

Applications of the XRF core scanner include:

- Rapid detection of volcanic tephra layers in lake sediments
- Sub-mm scale analysis and counting of sediment laminae (varves)
- Detecting metal pollutants (Pb, Zn, Cu) in lake and fluvial sediments
- Determining past erosion intensity from element ratios
- Weathering and leaching indices
- Past variation in hypolimnetic anoxia in lakes

• Sr/Ca and U/Ca ratios as palaeoclimate indicators in carbonate sediments

Potential users should contact **Dr Henry Lamb** or **Dr Sarah Davies** to discuss requirements and costs. This information is also available at <http://www.aber.ac.uk/iges/research/quaternary/xrf%20core%20scanner/scanner%20website.mht>

Dr Henry Lamb
Institute of Geography and Earth Sciences
University of Wales Aberystwyth
Aberystwyth SY23 3DB UK

8. Forthcoming Workshops Seminars & Conferences



Minding the Gap
The Postglacial colonisation of Ireland
1st- 3rd September 2006
The Boole Lecture Theatres
University College Cork, Ireland

When the Planet began to warm up and the ice sheets disappeared, Ireland remained a difficult, perhaps impossible destination. It may have also have been an unwelcoming place to live. Ireland could be regarded as a side show to the major events occurring elsewhere in Europe but an understanding of Ireland's postglacial colonisation can provide an uncomplicated key study with which the colonisation of the rest of Europe might be understood.

The choice of title is a reflection of the various gaps that need to be considered. The Irish Sea is an ever present gap that can become a vector for change. Gaps are perhaps the most significant characteristic of Ireland's ecology while the least appreciated but most important gap is the abyss in understanding how other disciplines carry out research and interpret their results.

Lecturers will include Bob Devoy, Tom Kelly, Paddy Sleeman and Peter Woodman (UCC); Dan Bradley, Pete Coxon, Frazer Mitchell, Eileen O Reilly, Julian Reynolds (TCD); Hein Bjerck (NTNU, Norway); David Croke (RCSI); Sinead McCartan (Ulster Museum); Nigel Monaghan

(National Museum of Ireland); Paolo Prodi (QUB); Jeremy Searle (University of York)

Friday Night: (Keynote Lecture)
Saturday: Lectures and Conference Diner
Sunday Morning: General discussion (Chaired by T. Douglas Price, University of Wisconsin)

Details on registration to follow
Peter Woodman, Paddy Sleeman & Bob Devoy
UCC

Environmental Archaeology in Ireland: new perspectives and recent research
Association for Environmental Archaeology
One-day Spring Meeting,
Saturday, 17th February 2007
University College Cork, Ireland

The last decade has witnessed an enormous increase in the number of archaeological excavations being undertaken throughout Ireland. This increase in excavation has been accompanied by a substantial increase in studies relating to environmental archaeology, both in the quantity of work and range of analyses being carried out.

It is envisaged that the Cork one-day meeting will provide a much-needed discussion forum for workers carrying out studies in environmental archaeology throughout Ireland, as well as updating the wider archaeological and environmental communities of latest research. It is also hoped that the meeting will attract people from Europe and beyond in order to compare approaches and results.

Offers of papers on any aspect of environmental archaeology relating to Ireland are welcomed. Papers relating to studies in areas beyond Ireland that may provide useful comparisons are also welcomed, for example studies relating to wetlands and islands. A selection of papers from the conference will be offered for publication in a future issue of Environmental Archaeology, the journal of the Association for Environmental Archaeology. Offers of posters will also be warmly welcomed.

For further information, please contact the meeting organisers:
Meriel McClatchie and Mick Monk
Department of Archaeology, University College Cork,
Cork, Republic of Ireland
Email: m.mcclatchie@ucc.ie & mmonk@archaeology.ucc.ie
Telephone: +353 21 4904048
Website: www.envarch.net



Water Resources in Ireland and Climate Change National Hydrology Seminar 2006,
Tuesday 14 November 2006
Tullamore Court Hotel, Tullamore, Co Offally
<http://www.ria.ie/committees/iccc/new.html>

Periglacial and Paraglacial Environments and Processes, Past, Present and Future,
Geological Society, London,
15-16 January 2007



Quaternary Research
Association

This meeting focuses on the periglacial and paraglacial environments of glaciated and mountainous regions, which are key to identifying the effects of climate change upon the Earth system. This meeting explores issues of permafrost change, slope stability, landscape evolution and mountain hazards in an inter- and multidisciplinary framework, and across a range of time-scales.

Who should attend?

This meeting will be of interest to Quaternary and Holocene scientists; mountain, periglacial, glacial, paraglacial geomorphologists; modellers; environmental managers; planners; and engineers.

Convenors

Dr Jasper Knight (j.knight@exeter.ac.uk) and Dr Stephen Harrison (stephen.harrison@exeter.ac.uk), Department of Geography, University of Exeter, UK
http://www.geolsoc.org.uk/template.cfm?name=Periglacial_and_Paraglacial

2006

NMR Spectroscopy in Soil, Geo and Environmental Sciences. Freising, Germany, 6-9 August 2006
<http://www.wzw.tum.de/bk/nmr06>

American Quaternary Association 36th Biennial Meeting (AMQUA) Bozeman, Montana
August 17-20, 2006
<http://bsi.montana.edu/web/amqua/>

Quaternary Research Association 5th International Postgraduate Symposium, Edinburgh, Scotland.
29 August 2006 - 1st September 2006
<http://www.geos.ed.ac.uk/conferences/qrapg2006>

Shaping the Earth's Surface: Dynamics & Changing Environments Sept. 25-29, 2006 in Potsdam
<http://www.geo.uni-potsdam.de/GV-2006/index.html>

2006 British Diatomists' Meeting October 27th - 29th. Field Studies Centre at Malham Tarn, The Yorkshire Dales National Park, UK.
<http://www.campus.ncl.ac.uk/staff/Stephen.Juggins/bdm.htm>

2006 Geological Society of America (GSA) Annual Meeting and Exposition 22 - 25 October 2006 Philadelphia, USA
<http://www.cona.cl/scor/oms.htm>

2007

4th International Limnogeology Congress International Association of Limnogeology (IAL) Barcelona (NE Spain) from 11th-14th July 2007
<http://www.ilic2007.com/>

XVII INQUA congress Cairns, Australia 28th July to the 3rd August 2007.
<http://www.aqua.org.au/AQUA/INQUA2007.html>

International Conference on Karst Hydrogeology and Ecosystems (Karst2007) 13 - 15 August 2007 Bowling Green, USA
<http://hoffman.wku.edu/karst2007/k2007.html>

People/environment relationships from the Mesolithic to the Middle Ages: recent geo-archaeological findings in Southern Italy 4 - 7 September 2007, Salerno, Italy.
http://www.news.unina.it/dettagli_agenda.jsp?ID=3277

9. General Membership Items

Renewal of Membership

Please check the date on your address label (on the Newsletter envelope) and contact the Treasurer if you think it is incorrect. Please let your students/ colleagues know about IQUA and encourage them to join.

Please complete the form at: http://www.tcd.ie/Geography/IQUA/Member/Mem_Hme.htm and send it with the relevant annual subscription to the Honorary Treasurer of IQUA.

Full members €15.00
Students and unwaged €10.00

Dr. Michael Philcox,
The Nettle Patch,
Red Bog,
Blessington,
Co. Wicklow.
E-mail: mphilcox@tcd.ie

Cheques should be made payable to IQUA. It is suggested that members pay two or three years subscription on a single transaction, to cut down on bank charges and maintain an active

membership for a longer time period. Note: The treasurer has confirmed that IQUA will accept Sterling cheques, although a small handling charge will be incurred.

IQUA discussion List

<https://listserv.heanet.ie/iqa-l.html>

IQUA members if you are not receiving IQUA listserv emails, please sign up!

To join the IQUA list go to listserv@listserv.heanet.ie and 'Join or leave the list (or change settings)'. A request for subscription to the IQUA-L list goes initially to the list moderator (Catherine Dalton) first for cross-referencing with the membership list.

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