# **Quaternary Perspectives**



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# XIX INQUA Congress 2015 Quaternary Perspectives on Climate Change, Natural Hazards and Civilization Nagoya, Japan 27<sup>th</sup> July – 2<sup>nd</sup> August 2015



We are all extremely excited about the upcoming XIX INQUA Congress in Nagoya, Japan. Registration and abstract submission have now closed. There are, however, still a few opportunities to book Congress excursions. The deadline for mid-Congress, pre-Congress (PRE-2) and post-Congress (PO-7 and PO-11) excursions is now 31<sup>st</sup> May 2015. For details please check 'Excursions' on the Congress <u>homepage</u>. Further questions and requests should be sent to <u>excursions@inqua2015.pj</u>.

All business meetings at the Congress will be held between 19.00-20.30 hours throughout the Congress period. 'Humans and Biosphere' (HABCOM) and 'Terrestrial Processes, Deposits and History' (TERPRO) have announced that they will hold their meetings on Tuesday 28<sup>th</sup> July, and 'Coastal and Marine Processes' (CMP) will hold their meeting on Friday 31<sup>st</sup> July (Further details below). Congress participants wishing to attend business meetings for the remaining two Commissions ('Palaeoclimate' (PALCOMM) and 'Stratigraphy and Chronology' (SACCOM)), should check the programme when they register at the Congress to find out when and where Commission business meetings will be held.

Please also look out for us (the QP Editors) in one of the Congress booths; we will be advertising QP and carrying out an interactive survey to get your feedback on how we can improve QP and broaden readership.

Please check the latest updates on the Congress <u>website</u>.

# From the INQUA President



In the run-up to the XIX INQUA Congress and the final few months of my term of office, there are a few matters I would like to bring to everyone's attention.

#### Take part

The Executive Committee has been trying to be more communicative and to make the workings of INQUA less mysterious. We want you to appreciate that there is something in INQUA for all, and everyone can play a part. One key point is that no part of INQUA is closed; we strongly encourage anyone who is interested and keen, to become involved at any level.

#### Commissions

The five Commissions (CMP, HABCOM, PALCOMM, SACCOM, TERPRO) cover the range of Quaternary sciences - so there must be one to interest you if you are a Quaternary scientist. Important points to note are that Commissions:

- are open to all, and welcome anyone with an interest in their area of research, so please go to the <u>INQUA website</u> to sign up as a corresponding member of a Commission;
- are run by volunteers, so please do not hesitate to find out how to become involved;
- play a crucial role in supporting projects for INQUA funding; and
- hold business meetings at the INQUA Congress, so be sure to attend those business meetings that most interest you. At these meetings you will be able to volunteer your future involvement in Commissions, and you will be able to find out more about the workings of the Commissions and make useful contacts.

#### **ECR Committee**

One of INQUA's primary aims is to assist Early Career Researchers (ECRs) to develop their careers. An important development during the last few years has been the formation of the INQUA ECR Committee, designed specifically to cater to the needs of ECRs. The Committee comprises representatives from all Commissions and is self-organising, with general guidance provided by the INQUA Executive Committee. Please see the <u>INOUA website</u> for more details. So far the ECR Committee:

- is run by ECRs for ECRs, which not only makes the Committee relevant to its members, but also provides ECRs with experience of the inner workings of a large organisation such as INQUA;
- has already held one very successful conference and will organise another in two years' time;
- edits Quaternary Perspectives for the Executive Committee;
- is increasingly playing an important role in keeping the Executive Committee informed about the needs and views of ECRs;
- will be represented at future Executive Committee meetings; and
- is set to become a formal part of the INQUA structure.

#### Medals

Another important INQUA activity is recognising excellent contributions both to Quaternary science and to INQUA itself. The following recipients of this year's medals will receive their medals at the Congress.

- Liu Tungsheng Distinguished Career Medal: Prof. Anne Wintle
- Sir Nicholas Shackleton Medal for outstanding young Quaternary scientists: Assoc. Prof. Robert Kopp
- INQUA Distinguished Service Medal: Prof. Nat Rutter

#### XIX INQUA Congress

If you did not already know it, you can have some say in what is decided at the business meetings held during the Congress even if you are not attending the Congress. The Executive Committee runs the Union on a dayto-day basis but it does not have the final say in how INQUA is run. Although all important decisions have to be accepted by the General Assembly, which is all those at the Congress, this is usually a formality. The main business is discussed and decided at the two meetings of the International Council, which consists of Delegate representatives from each member country. The Delegates are sent all documentation ahead of time so they can consult those whom they represent, and on whose behalf they will vote. This is where everyone can make a difference: make your views known to your member country's Delegate and your local committee. The key once again, is to become involved, which everyone can, and should, do. Your Delegates are willing to do the work but they need the input of all those whom they represent, and that includes you.

#### Quaternary International (QI)

For a good many years *QI* has been edited most successfully by Norm Catto, assisted by Thijs van Kolfschoten, to whom we owe a great debt. Now however, they are stepping down and we shall have a new Editorial team from August. The new team comprises Editor-in-Chief Min-Te Chen and Assistant Editors Barbara Mauz (CMP), Florent Rivals (HABCOM), Zhonghui Liu (PALCOMM), Alessandra Negri (SACCOM) and Asfawossen Asrat (TERPRO).

#### International Council for Science (ICSU)

As a full member of ICSU, INQUA is increasing its involvement in ICSU, thereby expanding the role INQUA plays in international science. We are a member of the Geo-Unions sub-group, with Allan Chivas as our representative, who also represented INQUA at the ICSU General Assembly in New Zealand. Sandy Harrison has been a member of the ICSU World Data System Scientific Committee for the past two years and has been renominated for a further term.

Future Earth (now an independent project) is a major initiative of ICSU, which INQUA is monitoring with a view to playing a significant part in the future. In addition to working with the Geo-Unions sub-group, INQUA is organising a special Future Earth session at the Congress. Those of you attending the Congress are encouraged to attend the session to learn about i) Future Earth itself (from leading figures), and ii) the direction that INQUA's involvement in Future Earth may take.

#### Finally

Remember: To give and receive maximum benefit from being part of the INQUA family, stay informed and stay in touch.

Margaret Avery 12<sup>th</sup> April 2015

#### THE INQUA NEWSLETTER

# **Candidates for INQUA Executive Committee positions**

The following is a list of the approved nominations for the INQUA Executive Committee of 2015-2019. The information is extracted directly from nomination submissions. Candidates for President and Vice President will deliver presentations to the International Council during its first meeting at the Congress. Before that, if you are interested in an Executive Committee position you are invited to contact your member country's Delegate representative to express your interest. The Delegate representative will then inform the International Council on your behalf.

#### President

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2.

#### Vice Presidents

- ASHWORTH, Allan (USA). He was INQUA's 1. Vice President from 2007-2011, and he had a particular interest in finance and membership issues. He championed the Liu Tungsheng Distinguished Service Medal and increased distribution of funds to support students to attend the XVIII INQUA Congress (Bern). On the request of INQUA's current President (M.Avery), since 2011 Prof. Ashworth has participated in meetings for ICSU's Scientific Committee on Antarctic Research (SCAR). SCAR's many Quaternary scientists tend not to work with INQUA. Subsequently, as an INQUA representative, Prof. Ashworth was the first to suggest: i) a SCAR delegate is invited to INQUA Congresses, and ii) both INQUA and SCAR share symposia at their respective Congresses. Prof. Ashworth was a member of the Palaeoecology and Human Evolution Commission (2003-2007), and as Vice Chair of the US National Committee 2. (USNC) INQUA, was involved in the organisation of the 2003 INQUA Congress in Reno, Nevada, USA. Prof. Ashworth has the combination of excellence in ideal internationally-recognised scholarly research and a strong ability to build relationships with scientists and policymakers from around the world. As President, he wants to develop closer links with the seven Geo-Unions, increase INQUA's leadership in matters of climate change and other Quaternary topics, increase outreach to other scientific disciplines, collaborate with professional societies around the world and further 3. encourage ECRs.
- OKUMURA, Koji (Japan). He has been INQUA's Vice President from 2003 to present. He was also the Japanese representative for the International Council from 1999-2003; Secretary of the Commission of Neotectonics from 1991-1995; and a member of the Commission of Tephrochronology.

- AUDEMARD, Franck (Venezuela: pending member country admission to INQUA). He has been INQUA's Vice President from 2011 to present and is the Founder of AVECUA (Asociación VEnezolana para el Estudio del CUAternario), 2015. He was also the Venezuela representative of Grupo de Estudio del Cuaternario (South America Quaternary Group), 2003-2011; coordinator of INQUA Project 0051 of TERPRO, 2006-2007; and cocoordinator of the Palaeoseismicity Working Group (later upgraded to a sub-Commission) for two consecutive inter-Congress periods (1995-1999 and 1999-2003). Finally, he was a full member of the reorganised Neotectonics and Palaeoseismology Focus Group of TERPRO from 2003-2007 and 2007-2011, as well as an active proponent and participant of the INQUA Environmental Seismic Intensity scale (ESI), 2007.
- GUO, Zhengtang (China). He was INQUA's Vice President for PALCOMM from 1995-2003. He was a member of the INQUA Commission on the Carbon Cycle from 1999-2003. Prof. Guo is particularly suited to the position of Vice President because of (i) his interdisciplinary research expertise and his fruitful scientific achievements in Quaternary science, (ii) his leadership in the Quaternary research community in China and in the loess research community of the world, and (iii) his experience and excellent ability in promoting international scientific exchange and 5. collaborations.
- PALOMBO, Maria Rita (Italy). She is a member of HABCOM; corresponding member of PALCOMM; member of the Editorial Board of QI; and co-leader of the INQUA Project 1403P "Modelling human settlement, fauna and flora dynamics in Europe during the Mid-Pleistocene Revolution (1.2 to 0.4 Ma)", sponsored by HABCOM. Dr Palombo is commended for her high standards of critical analysis and broad knowledge of Quaternary topics. As a leading specialist in mammals, she has always addressed the issues using a multidisciplinary approach. She took an active role in discussions on Global Boundary Stratotype Section and Point (GSSP). Her scientific fervour is also shown by the countless conferences and thematic sessions she has organised. The six QI volumes she has edited (one in progress) show her wide range of knowledge, as well as her resourcefulness. She also does a great deal of teaching on Quaternary subjects.

4. SINGHVI, Ashok Kumar (India). He has participated in INQUA's TERPRO Commission, the Dunes Atlas, Fluvial (FLAG) Archives Group and other geochronology programmes. In addition, he hosted an INQUA Commission meeting in India, as well as a meeting with the Indian Quaternary community in 2006. He was responsible for developing Indian membership for INQUA and actively supported INQUA's entry into ICSU as an Indian National Delegate to ICSU in Suzhou. Dr Singhvi has i) extensive international collaborations; ii) international recognition; iii) led the acclaimed International Geoscience Programme (IGCP); and iv) been a member of the International Geosphere-Biosphere Programme (IGBP) Past Global Changes (PAGES) Executive Committees and the Science Programme Committee (SPC) of the United Nations (UN) International Year of Planet Earth (IYPE). In IGCP/IGBP he focussed on helping scientists from less privileged countries via training courses and by forging collaborations. He is a team builder, with considerable experience in generating major collaborative programmes sans boundaries, including helping Indian neighbours to be partners in the bid for the International Geological Congress (IGC) 2020. He will bring scientific and interpersonal skills, as well as administrative experience in academies, to INQUA. He will enhance INQUA's interface with currently largely unconnected Asian communities.

VAN KOLFSCHOTEN, Thijs (The Netherlands). He was President of the INQUA Sub-Commission on European Stratigraphy (SEQS) from 1995-2003, and he was President of The Netherlands INQUA from 1999 - 2008 when he was the national Delegate representative at the INQUA International Council meetings in Durham (1999), Reno (2003) and Cairns (2007). Prof. van Kolfschoten has been regional Editor (Europe) of QI from 2003 to present. In addition, Prof. van Kolfschoten has been a member of SACCOM from 2003 to present, and Secretary of SACCOM from 2011 to present, representing SACCOM at board meetings in Caracas (2013), Rome (2014) and Cape Town (2015). He is a highly esteemed Quaternary researcher, and he is well-known in, and beyond, INQUA. For more than 25 years he has already successfully taken responsibility for a number of tasks within the INQUA organisation. He is therefore fully aware of what INQUA stands for and how INQUA needs to develop. Furthermore, Prof. van Kolfschoten has excellent managerial skills that will certainly benefit the Quaternary community. Moreover he is a nice person and a team player.

#### Secretary General (unopposed)

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Treasurer (unopposed)

CHASE, Brian (France). He is Founder and Steering Committee Director of the inaugural African Quaternary (AfQUA) meeting; President of the South African Society for Quaternary Research (SASQUA), 2009-2015; member of South African National Committee (SANC) for INQUA; member of the Advisory Board of HABCOM; (deputised for the) President of HABCOM at the 2015 (February) Executive Committee meeting; and corresponding member of PALCOMM. Dr Chase has excellent organisational and interpersonal skills, is media-active, is experienced with modern electronic communication systems, has an extensive network of collaborators, is aware of INQUA's international links and plans, and has strong links to INQUA's ECRs and Developing-Country Researchers (DCRs). Above all, he is an effective communicator and participates in a range of INQUA-related activities.

LOUTRE, Marie-France (Belgium). She has been Secretary and President of PALCOMM. She has served as the INQUA Treasurer for the last two inter-Congress periods. At the national level, Dr Loutre served as President of the Belgian Quaternary (BELQUA) representative of INQUA from 2006-2014, and is currently Secretary of this committee. During her service as INQUA's Treasurer she has gained experience on the internal working of the Union as well as its relations with other unions, in particular ICSU. As Treasurer she has established contacts with all members of the Union and with the leaders whose projects are supported by INQUA. Dr Loutre has also been involved in efforts to improve the visibility of the Union. Her expertise is therefore of crucial importance to INQUA.

# We need new INQUA ECR Committee members

Essential criteria: Enthusiasm and willingness to contribute to the ECR Committee and wider community, good organisational and communication skills. You must also be an ECR\* and a member of a Commission (to become a Commission member please email the relevant Commission Secretary to get yourself on the mailing list <u>here</u>). Desirable criteria: Experience with social media (Facebook, Twitter etc.), blogging, web skills and outreach activities.

\*INQUA defines ECRs as postgraduates within eight years of receiving their PhD. This period of eight years does not take into account periods of time taken not working as an academic or because of taking time off because of family responsibilities. Scientists who have been working for less than eight years but who have permanent (tenured) positions, even if they received their PhD within the previous eight years, would generally NOT be considered as ECRs.

If you are interested in joining the INQUA ECR Committee please briefly (250 words maximum) email the following information to the President of the Commission that you would like to represent:

- How does your current/future research fit within the Commission's goals and aims?
- What experience do you have in outreach activities, especially with the use of social media?
- Do you have any ideas for better engaging ECRs within INQUA activities?

Please also email any of the current INQUA ECR Committee for further information.

Provisional deadline: 30th May 2015.

# **Commission business meetings: INQUA Congress**

TERPRO: Terrestrial Processes, Deposits and History	CMP: Coastal and Marine Processes
July 28 <sup>th</sup> (Tue) 19.00-20.30 Room 431	July 31 <sup>st</sup> (Fri) 19.00-20.30 Rooms 222 & 223
This business meeting will focus on the new Commission structure and programmes for the inter-Congress period 2015 – 2019.	This business meeting will focus on the following:
Discussion will focus on the most relevant issues, as identified by the	Received nominations for Commission Committee members for 2015 – 2019:
INQUA scientific community, in Quaternary Terrestrial Processes, Deposits and History. We will present and discuss proposals for new International Focus Groups (IFGs) and projects in order to address and answer crucial scientific questions in the next four years.	<ul> <li>President: Dr Craig Sloss</li> <li>Vice Presidents: Andres Carlson and Yusuke Yokoyama</li> <li>Secretary: Lynda Petherick</li> </ul>
Our goal is to develop new criteria and methodological approaches for	INQUA ECR Committee representative for CMP;
scientific fields where Quaternary geology is not well recognised e.g. rates of soil formation, earthquake hazards evaluation, flood hazard evaluation,	CMP membership;
landscapes evolution, groundwater processes etc.	IFGs and Programmes;
Commission projects are requested to have a broad interdisciplinary perspective, and to involve a high proportion of ECRs in leadership roles.	Encouraging future applications to CMP in general e.g. projects;
	Promoting CMP:
HABCOM: Humans and Biosphere	- CMP Facebook page
July 28 <sup>th</sup> (Tue) 19.00-20.30 Room 221	- CMP newsletter
Agenda: To be confirmed	



#### MEDFLOOD - 1203P

Project Leaders: Jonathan Benjamin (Flinders University, Australia), Alessio Rovere (MARUM, Germany).

#### <u>Website</u>

#### MEDFLOOD workshop: Haifa, Israel, 20th-25th October 2014.

The third MEDFLOOD workshop was organised by a group of Israeli sea level scientists, coordinated by our local workshop leader, E.Galili, of the Zinman Institute of Archaeology, University of Haifa. At the workshop there were 13 international scientists from different countries, most of them ECRs, while a further nine Israeli colleagues joined the group during the activities. The group was equally composed of geologists and archaeologists working on palaeo sea level changes in the Mediterranean.



Fig. 2. Achziv park- rock cut pool, an archaeological sea level marker of Holocene age.



Fig. 1. The Rosh Hanikra last interglacial (MIS 5e) deposits are located on top of a palaeo abrasion platform.

The programme included three days of field activities and a writing workshop on the fourth day for brainstorming ideas for a research publication for submission to an international peer-reviewed journal.

After the arrival of workshop participants on Monday, the group visited the Galilee Coast and Haifa bay on Tuesday. The first stop of the day was the Rosh Hanikra last interglacial (Marine Isotope Stage (MIS) 5e) deposits that are being studied by our Israeli colleague D.Sivan (Fig. 1). After this, the group moved to Achziv park- rock cut pool; an archaeological sea level marker of Holocene-age (Fig. 2). Following this, we located and discussed last interglacial deposits along the Yassaf River. After lunch, the group moved to the well-known archaeological site of Akko, where mill stones were carved from a beach rock quarry. At the end of the day E.Galili led the group to an ancient crusader tunnel, and we discussed its possible significance as a sea level marker.

Wednesday's programme included an excursion to the Carmel Coast to observe Prehistoric sea level markers. First, the group visited the Mount Carmel Caves World Heritage Site and discussed the archaeology of the caves and their association

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with palaeo sea level. Afterwards the group visited the last interglacial deposits of the Lower Nahal Galim that are capped by palaeo soils of the Kurkar Hamra sequence, for which there are associated Prehistoric relics. The next stop was the Atlit coast where the group observed the submerged Neolithic settlement of Atlit Yam. The evening closed with two evening lectures delivered by D.Sivan and E.Galili on sea level changes along the Israeli coast according to archaeological and geomorphological markers.

The last field day was dedicated to archaeological sea level markers of the Carmel Coast. First the group went to see the rock cut pool and bollards of Tel Shikmona, discussing the significance of these structures as sea level markers. Afterwards the group moved to the ancient Roman town of Caesarea Maritima to observe the aqueduct, its port and the sea level markers that have been described in several publications. Israeli colleagues, B.Goodman and E.Galili, then provided an on-the-spot discussion into the possible causes for partial destruction of the port: tsunami or storms? Following this, the group went snorkelling in the partially destroyed part of the port (Fig. 3). After lunch the group was taken to the Habonim Nature Reserve and to Tel Dor to observe and discuss abrasion platforms, beach rocks and rock cut installations for salt manufacturing. In the evening two lectures were given; one by D.Zviely (The Recanati Institute for Maritime Studies, University of Haifa) was entitled "Haifa bay and the Nilotic sediment cell", and the second by B.Goodman (Chernny School of Sea Sciences, University of Haifa) gave a talk

entitled "Tsunamis in Israel: past and future".

On Friday the group met again for a writing workshop, led by J.Benjiamin (Flinders University, AU) and A.Rovere (MARUM & ZMT, University of Bremen). The participants were divided into three thematic groups: i) Last Interglacial, ii) Holocene, and iii) Archaeology. Each group was asked to collect ideas and references on Mediterranean palaeo sea levels and to summarise: i) what are the main debates/issues in your field?, ii) what is the state-of-the-art in your field, and the paradigms that are universally accepted?, iii) what are/should be the focus areas?, and iv) what are the key references and the best case studies? After two hours the groups re-joined and explained what had emerged from their discussions. Together the MEDFLOOD participants drafted the outline of a journal paper (Fig. 4) and leading authors were chosen for each section of the paper. At the moment the paper is in preparation.

On Saturday the group left for Tel Aviv airport. The MEDFLOOD 2014 meeting was a success. The field days allowed workshop participants to freely and directly discuss their views on palaeo sea levels. The mix of ECRs and more experienced researchers was beneficial for successful knowledge exchanges: all questions were asked and no question went unanswered during those three days. The writing workshop on the last day was an 'experiment' planned by two of the leaders. During similar workshops many potentially good papers have ended up abandoned because they were poorly planned. Instead, as part of our writing workshop, we all agreed on a scheme and took direct responsibility as authors on the paper, which we think will help the writing process and produce a publication for submission to an international peer-reviewed journal.

During the workshop it was decided that the next MEDFLOOD meeting will be held in October 2015 in Istria, Croatia, organised by two of the MEDFLOOD Principal Investigators (PIs): A.Fontana and S.Furlani. We thank E.Galili and our Israeli colleagues for the huge amount of work they did to make the 2014 workshop happen, and we look forward to welcoming them to the next meeting.



Fig. 3. Snorkelling inside the port of Cesarea Maritima.



Fig. 4. Drafting the outline of the paper during the writing workshop.



Modelling human settlement, fauna and flora dynamics in Europe during the Mid-Pleistocene Revolution (1.2 to 0.4 Ma) - 1403P

Project Leaders: Jesús Rodríguez (National Research Center on Human Evolution, Spain), Ana Mateos (National Research Center on Human Evolution, Spain), Christine Hertler (Senckenberg Forschungsinstitut, Germany), Maria Rita Palombo (Università di Roma "La Sapienza", Italy).

#### <u>Website</u>

Authors: J. Rodríguez<sup>1</sup>, A. Mateos<sup>1</sup>, C. Hertler<sup>2</sup>, & M. R. Palombo<sup>3</sup>.

<sup>1</sup>National Research Center on Human Evolution, Spain; <sup>2</sup>Senckenberg Forschungsinstitut, Germany; <sup>3</sup>Università di Roma "La Sapienza", Italy.

#### Foundations for the study of the Mid-Pleistocene Revolution (MPR)

The so-called MPR was a major environmental crisis driven by changes in orbital forcing which increased the amplitude of climatic oscillations. Changes in climate drastically affected vegetation in complex ways and led to a significant renewal of mammalian faunal complexes. Presence of human populations in Europe at the end of the Early Pleistocene is currently a widely documented fact. Strong evidence also demonstrates that Homo was able to colonise northern Europe shortly after the Matuyama/Brunhes (M-B) transition/boundary. However, the number of sites with evidence of human presence in Europe during the subsequent period (0.7-0.5 Ma) is strikingly scarce, leading some authors to propose a depopulation of the continent during that time interval. Moreover, the artefacts recovered from most archaeological sites younger than 0.7 Ma are considered Oldowan technological complexes or Mode 1, although some recent findings, like the Barranc de la Boella site, suggest that Mode 2 was also present in Europe at the end of the Early Pleistocene. In

contrast, archaeological sites younger than 0.5 Ma represent Acheulean complexes or Mode 2. Apparently, a discontinuity exists in Europe between Mode 1 and Mode 2 technologies. This scenario is confounded by the disappearance of Homo antecessor and the eventual appearance of Homo heidelbergensis at 0.5 Ma. With these data in mind, a complex scenario arises for the early colonisation of the continent, with phenomena such as dispersal events, replacements of species, and abandonment of territories with unfavourable conditions for human colonisation, playing a significant role.

This project is a continuation of the 2014 pilot project that intends to eventually develop into an IFG in the next inter-Congress period (2015-2019). Our main aim is to bring together researchers with experience in the study of archaeological evidence on the colonisation of Europe in the Early and Middle Pleistocene; specialists who may provide primary data on potential constraints to human settlement (palaeoclimate, mammalian faunas, palaeoflora, palaeogeography, quantitative palaeoecology, sedimentology, palaeosoils etc.) and specialists in mathematical modelling. This interdisciplinary group of researchers will combine efforts to investigate the continuity/discontinuity in the human populations of Europe in relation to the MPR, its timing and mode. A workshop will be held at Frankfurt on 16th July 2015 as part of the

EXPANSIONS 2015 Conference organised by ROCEEH (Role of Culture in Early Expansions of Humans), and will focus on quantification and modelling techniques for investigating distribution patterns of hominins in relation to environmental and other factors. Different approaches, including stochastic approaches, environmental niche modelling (ENM) and agentbased modelling (ABM) will be presented and discussed.

A major goal of the project is to create a network of interconnected databases including data on the distribution of hominins and other organisms, as well as environmental proxies and any other type of data relevant to our topic. As a first step, a connection has been created between the NQMDB (Neogene-Quaternary Mammals Database), which is stored and maintained at the Centro Nacional de Investigación sobre la Evolución humana (CENIEH) in Burgos, Spain, and the ROCEEH Out of Africa Database (ROAD). The ROAD database is a geo-relational spatial information system, both complex and flexible at the same time, providing analytical tools. The NQMDB mainly contains information on the distribution of Quaternary mammals in Europe and ecological information about those species. The connection between the two databases is viewed as a template for the creation of an even wider network of databases relevant for the planned IFG.



Fig. 5. Distribution of the Pleistocene sites included in the NQMDB as viewed in ROAD.

#### UATERNARY PERSPECTIVES

#### Cultural and palaeoenvironmental changes in Late Glacial to Middle Holocene Europe—gradual or abrupt? -1404P

# Project Leaders: Erick Robinson (University of Wyoming, USA), Felix Riede (Aarhus University, Denmark).

Over the past decade increasingly high-resolution palaeoenvironmental and archaeological records across Europe have enabled researchers to question the impacts of rapid versus gradual palaeoenvironmental change on Late Glacial to Middle Holocene hunter-gatherer societies. These advances have highlighted the complexities of climate-ecosystem-human interactions as well as the complexities of human response. In some regions there is little evidence for direct causal relationships between palaeoenvironmental change and cultural change, whereas in other regions there is clear evidence between the two. Identifying the reasons for this variability-rooted arguably in past ecological, settlement-historical, or technological differences, or simply in differences in analytical scales between studies-is a key challenge for archaeology with major implications for our general understanding of rhythms, patterns and processes in prehistory. In this project we aim to bring archaeologists and palaeoecologists together in the study of chronological modelling, faunal remains, geomorphology, plant remains, stable isotopes, and stone tools. We aim to compare evidence from different continental regions in order to move towards a better understanding of the data requirements, analytical scales, and approaches in the study of sudden versus gradual socio-cultural change and the diverse forcing mechanisms behind these changes. By involving specialists in eco-cultural niche modelling, species distribution modelling, and agent-based modelling, particular attention will be given to the diverse and unique feedback relationships between climate change, ecosystem response, and forager cultural change across a wide range of ecological contexts. The project develops a pan-European network in order to (1) lay theoretical and methodological foundations in the subject, and (2) compile the first ever continental-scale archaeological and palaeoenvironmental database in order to facilitate an integrative and diachronic study of Late Glacial to Middle Holocene humanenvironment interactions. Interactions such as those associated to abrupt climate change events, gradual ecosystem changes, sea-level changes, and extreme events such as volcanic eruptions and tsunamis, will be included.

#### Inaugural Workshop, Aarhus University, Moesgård Museum: 18<sup>th</sup> -20<sup>th</sup> November 2014.

This inaugural workshop included 19 researchers from 11 different countries. The workshop aimed to bring project members together for the first time to present regional and temporally specific case studies as potential foundations for the threeyear project. These case studies were presented alongside presentations from specialists in different modelling techniques such as Bayesian chronological modelling, Approximate Bayesian Computation modelling of cultural evolution, ecocultural niche modelling, and agent-based modelling. Modelling specialists presented information on the kinds of data necessary for their respective approaches. Discussions focused on the amenability of different regional and temporally specific case studies for different analytical models, with particular reference to scaling-up to inter-regionally comparative analyses, geo-referencing, and integration with high-resolution palaeoenvironmental records across Europe.

Case study presentations were predominantly from northern Europe, with just two presentations focusing on the record from southern Europe. Presentations displayed a remarkable variety of responses human to different palaeoenvironmental changes from the Late Glacial to Middle Holocene. Three time-slices show considerable potential for further investigation: i) the late-Allerød to middle Younger Dryas (YD) chronozones (Greenland Ice Core Chronology: Greenland Interstadial-1b to Greenland Stadial-1), ii) the later YD to the Preboreal Oscillation (Greenland Ice Core Chronology: end GS-1 to '11.4 event'), and iii) the '9.3 ka BP event' to the '8.2 ka BP event'.

The first time-slice highlights widespread changes in human mobility, lithic technologies and archaeological taxonomic units that were possibly the results of climate dynamics between the end of the Allerød and the first centuries of the YD. Alongside discussion of these more gradual palaeoenvironmental changes, there was discussion around the growing evidence for possible impacts of more abrupt events (e.g. the GI-1b cold event and the Laacher See volcanic eruption) on human societies across northern Europe.

The second time-slice highlights three major changes falling between the end of the YD and the Preboreal Oscillation: i) broadening diet breadth in southern Europe, ii) the transition from Final Palaeolithic to Mesolithic traditions across the North European Plain, and iii) the pioneer colonisation of areas bordering the receding Scandinavian Ice Sheet (SIS). Compared to the first time-slice, the second time-slice is particularly interesting because there is less evidence for relationships between human cultural changes and abrupt events. This period therefore promises to enhance the ways in which we interpret human responses to gradual versus abrupt palaeoenvironmental changes. Furthermore, it challenges researchers to focus on more clearly defined taxonomic units, since this period is the break between more tightly defined Final Palaeolithic units and more loosely defined Mesolithic units. To further complicate matters, however, the evidence from the first time-slice indicates that microlithization, and even trapezes (which have traditionally been interpreted as hallmark units of the Mesolithic), appeared much earlier during the Late Glacial, which challenges our ability to model cultural change based on traditional taxonomic categories.

The third time-slice falls between the 9.3 ka BP and 8.2 ka BP cold events. Presentations indicated human responses across northern Europe during this period. During this period there seem to be very interesting differences in human responses to events between the Central European Loess Belt and northern Scandinavia. In both regions there are marked changes in human settlement systems, distribution/exchange networks, and lithic technologies. However, the changes in northern Scandinavia are drastically different than in more southern areas. Southern and central Europe provide evidence for florescence in standardised blade/microblade and armature industries that suggest a complex mix of residential/mobility planning. In contrast, northern Scandinavia indicates the loss of microblade technologies in favour of less-standardised quartz industries, which occurred alongside the initiation of coastalinland mobility strategies. These differences highlight the problems of associating particular changes in lithic technologies with specific kinds of mobility changes. This third time-slice therefore enhances our understanding of the flexibility of human adaptations to palaeoenvironmental changes of different magnitudes and tempos.

Discussions at this workshop focused on the development of four working groups (WGs) to move us towards a multi-model investigation of different time-slices over the next two years of the project: WG1—Chronology; WG2—Material Culture; WG3—Palaeoenvironment; WG4—Modelling. Each of the WGs formulated central problem areas that were then shared between all WGs, in order to promote interdisciplinary research.

The workshop concluded with the different WGs coming together to develop a plan of action for the second year of project funding. We will utilise a Mendeley platform to start developing a database, or site register, of important archaeological and palaeoenvironmental sites for each of the three time-slices of focus. The multi-modelling approach of the project requires all data in this database to be properly geo-referenced. Once the geo-referenced data has been imported to the database by each project member for all respective WGs, we will rank both the archaeological and palaeoenvironmental data in terms of their relative quality (e.g. chronological resolution, single/multi-component site, quantitative data available, abundance of relevant variables, etc.). Chronology is of course very important for testing human and ecosystem responses to different kinds of palaeoenvironmental change, but one of the key outcomes of this workshop was identifying differential roles of chronology in different regions. For example, in areas of northern Europe such as Norway or Russia/Estonia the radiocarbon (14C) dataset is rather limited and the regional chronologies are more reliant on non-14C sea level reconstructions. It is therefore paramount that we ensure our sites are geo-referenced rather than develop our database based on whether or not a site is dated. Our ranking system will thus incorporate chronology into the ranking of individual data points. This database development will comprise most of the second

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year of the project, putting us in a position to focus solely on modelling that data in the final year of project funding. Outcomes of the 2014 Inaugural Workshop are to be published in a special volume of *QI*. The second workshop of this project will take place in Nice, France in November 2015. This project has also organised a session at the XIX INQUA Congress in Nagoya. The session will showcase initial results from the project alongside presentations from Asia and North America, in order to develop a broader Northern Hemisphere comparative perspective on the dynamics of ecosystem and human responses Late Glacial to Middle Holocene to palaeoenvironmental changes.

#### Reconstructing hunter-gatherer mobility: building new interdisciplinary frameworks in the Quaternary - 1502P

Project leaders: Rebecca Wragg Sykes (Université de Bordeaux, France), Julien Riel-Salvatore (Université de Montréal, Canada) and Suzanne Pilaar Birch (University of Georgia, USA).

Here we announce the start of a new project, intended to run for three years, which aims to establish the current state of knowledge and unite diverse research practices in Prehistoric huntergatherer mobility, as an essential step to building coherent and robust frameworks for future interdisciplinary enquiry. Despite the fact that mobility is a central concern in reconstructions of past human behaviour, there has been remarkably little critical discussion on what we mean by this concept, how we identify it archaeologically and how to develop common analytical frameworks to examine relevant data. It is intended that this project will stimulate debate and strengthen interdisciplinary networks, promoting integrative approaches that balance the disadvantages of single methods, as well as enabling comparisons and testing against multiple forms of data. Our long-term goals are to: 1) clarify theoretical frameworks and identify different types of direct and indirect data that researchers use to analyse and measure past hunter-gatherer mobility, 2) target areas of potential fruitful interdisciplinary research and define new frameworks that enable the integration and comparison of disparate models and datasets, and 3) establish the importance of understanding mobility for ongoing and future Quaternary research using empirical and replicable data to better put into practice theories that depend on concepts such as adaptive responses and social networks.

A primary aim is to establish a WG (particularly including ECRs) for cross-disciplinary, intercontinental development and synthesis of data, and for modelling and theory-building in order to examine diversity in hunter-gatherer mobility across varied Quaternary climatic and environmental contexts. We anticipate that this will lead to the development of an online (and ultimately open-access) mobility database. Initially we will focus on contexts for testing data within North America and Europe, but the project also includes researchers working in other regions who will provide valuable insight and expertise in order to expand the project's breadth/reach in the future. We intend the research network to be a rich, lasting arena for knowledge transfer and synergies between different disciplines, acting as a seed for future research projects, and potential formation of an IFG with an expanded remit.

We also aim, at the end of the three years, to create a cross-disciplinary resource that provides an assessment of the different methods, analytical approaches and potential limitations of different data for identifying and measuring mobility. This will include identification of archaeological contexts where interdisciplinary approaches are invaluable to answering questions on huntergatherer mobility e.g. where archaeological records with multiple types of preserved material are amenable to varied analyses.

In advance of the project application to INQUA we ran a pilot conference session (B51) during the XVII Union Internationale des Sciences Préhistoriques et Protohistoriques (UISPP) World Congress, 1st-7th September 2014, Burgos, Spain. This involved more than 30 researchers. R.Wragg Sykes provided an introduction to the session. Presentations were given on methods for sourcing of lithic raw materials, archaeological case studies of raw material procurement patterning, hominin migration cognition, and examining hominin mobility through faunal models. The session was a success, with lengthy and energetic discussions that we feel show great promise for INQUA Project 1502P.



Fig. 6. Pre-project session at the Burgos UISPP; J. Riel-Salvatore giving his paper.

Following confirmation of funding, the project has begun by arranging initial meetings and activities.

During the XIX INQUA Congress we will present an introductory paper on the project during the session run by E.Robinson and F.Riede, on INQUA Project 1404. It is clear that there is substantial potential for fruitful collaboration between these two projects, with knowledge exchange based around analytical approaches and identification of particular contexts where mobility might be expected to change as a result of palaeoenvironmental flux. We hope to develop useful case studies that can test our integrated comparative approaches to mobility. We will also ensure co-attendance at meetings held by both projects. In addition, the XIX INQUA Congress session run by S.Pilaar Birch on faunal migration and isotopes will be related to our project.

In mid-late September 2015 we will hold an online seminar (webinar) to enable project participants to "meet", with a full introduction to the project's

outline of activity, and the areas we intend to focus on.

We plan to hold the first full meeting in Montréal, Canada, in either October or November 2015. We will be using the INQUA funding to contribute to the travel costs of ECRs for this meeting. The meeting will consist of three days of activities. On the first day there will be a project grounding event, where the leaders will present a welcome paper, and participants will be asked to give short talks outlining methodological and theoretical approaches they take towards the study of mobility. This will permit a clear understanding of the different disciplines involved in the project, and stimulate discussion about the strengths, limitations and potential areas of overlap of different approaches. The second day will be run as a more informal workshop, aimed at promoting cross-disciplinary discourse. Subjects will include 'wish lists' for ideal datasets/sites, potential for multi-method comparative analyses, and discussion of the types of resources that would be useful. Preliminary considerations for creating workable and productive synthetic databases for interdisciplinary approaches will be put forward. The third day will comprise a planning meeting for the project leaders. Appropriate meeting trips are being considered for those participants able to stay more than two days.

In addition to this initial meeting, a later workshop will be planned for 2016, to focus on establishing a framework for multi-disciplinary investigation of past mobility, with particular emphasis on the identification of the best research contexts for multi-proxy analysis e.g. most promising archaeological records (regions/periods or palaeoecological contexts). This second workshop aims to select particular contexts where comparative approaches would be highly effective e.g. utilising lithic sourcing in concert with faunal data. The location and date for this event is to be confirmed.

We intend to hold regular online seminars over the three-year project period. This will avoid issues caused by repeated travel, enable constant updating of information and allow participation of members who are not able to attend all physical meetings. A final symposium at the end of the project in 2017 is planned. This third meeting is intended to be an international-scale conference, promoting the project results to the wider Quaternary science community.

Currently the project website is in the process of being set up. It is intended that it will be a resource for project members and will be key to disseminating the project results and activities to the wider audience.

#### PAGES working group LandCover6k: Open Discussion Meeting at XIX INQUA Congress (HABCOM and PALCOMM joint meeting)

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The PAGES WG LandCover6k was launched in November 2014, and will run until 2020. The major goal of this PAGES WG is to generate global land cover and land use reconstructions over Holocene timescales through synthesising existing palaeoecological and archaeological/historical datasets that describe anthropogenic land cover change since the start of agriculture across the world. Phase 1 (2015-2017) of LandCover6k will focus on three time windows: 6 ka, 0.45 ka and 0.1 ka BP. Reconstructions will be used to evaluate and improve model-based anthropogenic land cover change scenarios (ALCCs) such as HYDE3.1 (Klein Goldewijk et al., 2011) and KK10 (Kaplan et al., 2009). Improved ALCCs will be useful (or essential) for climate modelling studies, particularly because (1) whilst global and regional climate models can simulate potential natural vegetation, they cannot yet simulate anthropogenically-forced vegetation cover, and (2) there may be great differences between ALCCs, and as such independent evaluation is required

(Gaillard et al., 2010).

LandCover6k is coordinated by Marie-José Gaillard (Linnaeus University), who is also responsible for managing land cover efforts, with Kathleen Morrison (University of Chicago) coordinating land use reconstructions. They are supported by a Steering Committee reflecting continental sub-groups. The organisation, key participants and planned activities are described

at <u>www.pages-</u> igbp.org/workinggroups/landcover6k/intro.

The PAGES activities and workshops are open to all, and we encourage participation from archaeologists, historians, geographers and palaeoecologists who have an interest in contributing to the scientific goals of LandCover6k. Interested scientists or groups should contact Marie-José Gaillard or regional coordinators in the first instance. Further details will be circulated closer to the time.

In October 2015 Kathleen Morrison will convene a workshop in Europe on global land-use systems, with final details to be announced on the PAGES WG website.

For further information please contact Dr Ralph Fyfe, University of Plymouth (ralph.fyfe@plymouth.ac.uk)

# African large carnivores: impacts on ecosystems and humans interactions - 1402P

Project Leaders: Ogeto Mwebi (National Museums of Kenya, Kenya) and Jean-Philip Brugal (National Centre for Scientific Research, France).

The primary aim of this project is to bring together young and senior researchers, involved in past and present studies of large carnivores, to share existing data and to improve skills and outputs, in order to explore questions related to past and present human-carnivore interactions and their application to modern carnivore conservation. To address this aim the project organised a two-day international conference (24th - 25th June 2014) at the National Museum of Kenya (NMK). This was the first international meeting for this project. It was split into three sessions with three themes: 1) Human-carnivore interactions and conservation, 2) Past and present carnivore biodiversity and their environment, and 3) Past and present carnivore taphonomy and eco-ethology.

The conference was opened by the Director of Research and Collections of the NMK on behalf of the Director General of NMK. The Cultural Counsellor of The French Embassy in Kenya and the eastern Africa Regional Director of the French Institute for Research and Development (IRD) (whose institutions partly sponsored this conference) gave short speeches. These opening speeches commended the organisers of this conference and reiterated their support for future activities within the carnivore researchers' network. Two key note talks were presented; the first by L.Werdelin on African carnivores' evolution and their diversity based on their fossil record and the second by K.Holekamp who discussed evolution of bone cracking hyaenas' behaviour and their present conservation status. A total of 23 talks representing nine countries were presented by senior scientists, ECRs and several students.

In the first session D.Green discussed the influence of humans on carnivore population dynamics at the Masai National Reserve in Kenya and C.Twesigye discussed land use effects on lion populations in Queen Elizabeth National Park in Uganda. These two presentations highlighted the influence of humans on carnivore behaviour. In the same session J.Kerbis discussed the nature of human-eating lions and P.Fosse traced humanhyaena conflicts to Prehistoric times. Later, I.Mwenja discussed the socio-economic effects of predator proof fences in pastoralist's homesteads in Kenya and M.Muriuki discussed the effects of livestock loss to lion depredations and other wildlife on pastoralists in Kenya. The 'Humancarnivore interactions and conservation' session closed with M.Mutoro's presentation on the cheetah prey base in human-occupied areas in southern Kenya and by W.Okaka's presentation on the role of community media in promoting sustainable carnivore conservation.

Presentations in the second session focused on carnivore biodiversity documentation techniques, their evolution, health and adaptation to their environment and the challenges of climate change on their conservation. B.Agwanda discussed carnivore diversity documentation using camera traps and gave a case study of a disturbed forest reserve in Kenya. W.Chitakali presented and discussed the ecology, distribution and population status of carnivores in Mt. Mulanje in Malawi. M.Wyskyra presented tools for range-wide analyses of cheetah distribution and E.Chelysheva documented cheetah ecology and conservation challenges by comparing two cheetah populations (Masai Mara National Game Reserve and Meru National Park cheetahs) in Kenva. Carnivore health was discussed by M.Shamir who gave two presentations on the treatment of clavarial hyperosteosis in wild lions and captivity-related skull malformation conditions in lions. They were followed by a discussion on the effects of climate change on lions. J.Kerbis discussed effects of climate change on lion distribution based on modelling while T.Jirmo discussed the impact of severe climate variability on lion population structure based on a case study from the Amboseli Ecosystem in Kenya. The 'Past and present carnivore biodiversity and their environment' session closed with presentations by J-P.Brugal who compared Quaternary carnivores in Western Europe with the African carnivore guilds and C.Meloro who discussed field morphological adaptations eastern to Africa palaeoenvironments.

The final session focused on taphonomical studies and eco-thological reconstructions. Discussions in this session were initiated by the keynote speaker, K.Holekamp, who spoke about the behavioural ecology of bone-cracking hyaenas. This was followed by a comparative study by J-B.Fourvel who discussed extant African and extinct European hyaena bone accumulations aimed at amassing data to help interpret past bone assemblages. Modern bone accumulation and modification patterns were explained by using a comparative study of the spotted and striped hyaena bone accumulations in Kenya (O.Mwebi) and that of the brown hyaena in Namibia (G.Avery). The 'Past and present carnivore taphonomy and eco-ethology' session closed with G.Avery's presentation on the (often ignored) Black-backed jackal bone taphonomic studies in Namibia. A panel discussion on the future of the network was convened on the final afternoon of the conference. This discussion generated some very exciting ideas in order to facilitate the growth and expansion of the network. Participants proudly confessed they found the opportunity to network with peers extremely valuable. The conference received extremely positive feedback from participants with an overwhelming majority saying they would like to see another carnivore conference in the near future. 95% of the delegates reported that the conference had met their expectations. Over both days, a total of 84 people attended the conference. This was then followed by a two-day Studies Workshop, 26th - 27th June 2014.

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Fig. 7. Conference participants.

#### Comparative bone collection preparation, carnivore bone assemblages and prey remains Studies Workshop 26<sup>th</sup> - 27<sup>th</sup> June 2014.

The two-day workshop, facilitated by L.Werdelin, J-P. Brugal, C.Ogola, N.Gitahi and J.Kibii, attracted 30 participants on the first day and 26 participants on the second day. C.Ogola introduced skeletal identification techniques, followed by J.Kibii's presentation on skeleton preparation using an easy and cost effective methodology (dermestid beetles). These presentations were then followed by a practical session facilitated by senior researchers J.Kerbis, P.Fosse, O.Mwebi and J-P. Brugal. After the modern bone identification exercises participants were introduced to fossil remains analysis and processes. taphonomic L.Werdelin took participants through the process of fossil carnivore identification (thanks to fossil collections stored in the Palaeontology Section of NMK) and this was followed by a practical session on taphonomical and prey representation analysis, which was facilitated by all the senior researchers at the workshop. The prey remains analysis and taphonomy session was conducted using modern spotted hyaena den collections stored in the NMK

(osteology laboratory). J-P.Brugal introduced participants to using carnivore coprolites in the study of taxonomy, prey representation analysis, palynology, parasitology, DNA (palaeo/modern genetics), isotope analysis and palaeoenvironmental reconstruction. Later, N.Gitahi led a practical session on using carnivore scats to analyse prey diversity using hair remains extracted from the scat.

The workshop concluded with an evaluation session and the participants called for more workshops in the future. Some of the network members' activities in 2014 are given below.

### Members' activities after the Conference and the Workshop.

O.Mwebi attended a two-day meeting in Nairobi, Kenya (30th October - 1st November 2014) organised by the French IRD and the HEREGO (Heritage, Resources and Governance) PAREGO (Patrimoines, Ressources, Gouvernance) programme, which brought together projects funded by the programme (our project was initially funded by this programme in 2012). This meeting aimed to share ideas and experiences of the grantees as well as identify areas for future collaborations. This meeting was also attended by C.Ogola who is a member of our network. Possible future collaborations were identified between our project and researchers working on the reconstruction of ancient pastoralists' lifestyles, and a representative from Uganda suggested that we should join hands with Ugandans in order to recruit more East Africans.

B.Agwanda (a new member of the network) and O.Mwebi spent six days (3<sup>rd</sup> - 9<sup>th</sup> November 2014) at the Loldaiga Ranch (Laikipia, Northern Kenya) carrying out a reconnaissance survey of animal

distribution in the ranch using both conventional and skeletal remains methods. The ranch has both livestock and wildlife and is highly tolerant of carnivores which form part of the ranch's tourist attraction. Hence this ranch is an ideal site for our project, which examines human-carnivore interactions and taphonomic details. Therefore, fieldwork was partly aimed at identifying suitable training sites for the carnivore researchers' network. Several den and raptor roost sites were identified during this trip and ranch management supported our idea of using the ranch as a training site. We will however, search for additional sites in order to secure the most suitable one. Fieldwork was funded by the NMK and the ranch itself.

In an effort to expand the project's taphonomic material/database O.Mwebi, S.Ambrose and K.Mwanzia started analysis of material from an 800-year-old archaeological and hyaena den site (Narok, Kenya). This work is almost complete. The results from this work will be used in future activities in our network, and will be published in a peer-reviewed journal.

Session on "Carnivores and their Prey: from modern to fossil evidence" at the 5th Conference of the East African Association for Palaeoanthropology and Palaeontology (EAAPP)

> Dar es Salaam, Tanzania, 3<sup>rd</sup> - 6<sup>th</sup> August 2015

Discussions will revolve around prey-predators relationships in different ecosystems.

A planned two-day workshop and training on carnivore anatomy, evolution, taphonomy, scat and hair analysis for students/ECRs from African countries.

National Museum, Nairobi, Preliminarily scheduled for autumn 2015

You can express your interest to participate as a student or as a professional who would like to give a seminar and/or contribute to training. Support could be given for travel, accommodation and meals.

For further information please contact O.Mwebi (<u>Ogeto\_mwebi@yahoo.com;</u> <u>omwebi@museums.or.ke</u>) and J-P.Brugal (<u>Brugal@mmsh.univ-aix.fr</u>).



Fig. 8. Workshop activities (modern and fossil bones and scat analyses).



#### Report of the Field Workshop on the Lower-Middle Pleistocene transition in Italy

Supported by AIQUA (Associazione Italiana per lo Studio del Quaternario), SACCOM and the Subcommission on Quaternary Stratigraphy (SQS) of the International Commission on Stratigraphy (ICS).

Field Workshop: 11th-13th October 2014, Bari, Italy.

Coordinator: Nei Ciaranfi1.

Organisers: Angela Girone<sup>1</sup>, Patrizia Maiorano<sup>1</sup>, Maria Marino<sup>1</sup>, Adele Bertini<sup>2</sup>.

Authors: Neri Ciaranfi<sup>1</sup>, Martin J. Head<sup>3</sup>, Maria Marino<sup>1</sup>.

author: Corresponding Neri Ciaranfi (nericiaranfi@yahoo.it).

<sup>1</sup>Università degli Studi "Aldo Moro", Italy; <sup>2</sup>University of Florence, Italy; <sup>3</sup>Brock University, Canada.

#### Abstract

The Field Workshop on the "Lower-Middle Pleistocene transition in Italy" was organised by AIQUA, sponsored by SACCOM and SQS, and supported by the Department of Earth & Geoenvironmental Sciences of the University Aldo Moro in Bari (Italy). The workshop presented the latest multidisciplinary studies examining two Italian marine sequences: i) Montalbano Jonico in Basilicata, and ii) Valle di Manche in Calabria. Both sequences are candidates for selection for the Middle Pleistocene Subseries GSSP. A third GSSP candidate section (the Chiba section in Japan) was also presented. Two significant Lower-Middle Pleistocene lacustrine intrapenninic successions, San Lorenzo in the Sant'Arcangelo Basin (south Italy) and the composite section of Sulmona in the Sulmona Basin (central Italy), were also discussed. A two-day field excursion included visits to Montalbano Jonico and Valle di Manche sections, and to the lacustrine deposits of the Sant'Arcangelo Basin.

### Workshop

The organisation of this scientific event was proposed by AIQUA and sponsored by SACCOM and SQS (ICS). Its primary aim was to discuss the latest multidisciplinary research on two Italian candidates for the GSSP for the Middle Pleistocene Subseries (Montalbano Jonico and Valle di Manche) and to examine these sections in the field. The organisation of this Field Workshop was made possible through the invaluable assistance of S.Gallicchio (University of Bari) and L.Capraro (University of Padova). Additional help in preparing the field trip was kindly given by the Mayor of Montalbano Jonico, E.Devincenzis, and his staff.

#### 2. Workshop programme

The Field Workshop was held in Bari, 11th- 13th October 2014. Its main purpose was to present two Italian candidate sections for the Middle Pleistocene GSSP. In addition, the latest research on the third GSSP candidate (the Chiba section in Japan) was presented, and two Lower-Middle Pleistocene lacustrine sequences (the San Lorenzo palaeolake in Basilicata (south Italy) and the Sulmona palaeolake in Abruzzes (central Italy)), were reviewed. All presentations took place at the Department of Earth and Geoenvironmental Sciences of the University Aldo Moro in Bari. About 30 scientists, mostly Quaternary stratigraphers and palaeontologists, attended the meeting, with representatives from France, UK, Canada, Taiwan, Japan and Italy (Fig. 9). Individual presentations are given below, with speakers indicated by an asterisk (\*).

2.1 The workshop opened with two introductory presentations given by M.Head. The first explained the requirements and mechanisms for selecting the Middle Pleistocene GSSP candidates, and the second summarised the major features of the Early-Middle Pleistocene transition, especially for MIS 19 (in which the transition/boundary is likely to be placed). The presentations were: 1 -Head, M.J.\* - Defining the Lower-Middle Pleistocene GSSP: procedures, practicalities, and pitfalls; 2- Head, M.J.\*, Gibbard, P.L. - The Early-

1. Introducing the AIQUA - INQUA - SQS Field Middle Pleistocene transition: latest developments and emphasis on MIS 19.



Fig. 9. Participants at the Field Workshop on the Lower-Middle Pleistocene transition in Italy. The badlands west of Montalbano Jonico village are visible in the background.

2.2 A second group of presentations, addressing the results of the more recent studies on the Montalbano Jonico section, included: 3 - Ciaranfi, N., Aiello, G., Barra, D., Bertini, A., Girone, A., Lirer, F., Maiorano, P.\*, Marino, M., Petrosino, P., Toti, F. - The Montalbano Jonico section in the south Apennines foredeep (Italy): a reference for the Early-Middle Pleistocene transition; 4 -Petrosino, P.\*, Jicha, B.R., Mazzeo, F.C., Ciaranfi, N., Girone, A., Maiorano, P., Marino, M. - The Montalbano Jonico marine succession: an archive for distal tephra layers at the Early-Middle Pleistocene boundary in southern Italy; 5 - Bertini, A.\*, Toti, F., Ciaranfi, N., Girone, A., Maiorano, P., Marino, M. - Climate stratigraphy across the Early-Middle Pleistocene boundary from palynological data of the Montalbano Jonico section (South Italy); 6 - Toti, F.\*, Bertini, A. -Vegetation and climate changes throughout the Montalbano Jonico section from MIS 18 up to MIS 16: new insights and preliminary results. These interdisciplinary investigations provided a timely appraisal of the Early-Middle Pleistocene transition in Montalbano Jonico, especially for the MIS 21-18 time interval, with particular emphasis placed on the palaeoclimatic evolution during MIS 19 and its regional to global correlation with the M-B transition/boundary.



Fig.10. Ideale Section, Montalbano Jonico section with evidenced volcaniclastic layers (V3 and V4).

2.3 A third group of presentations, discussing the recent results on the Valle di Manche section, comprised: 7 - Capraro, L.\*, Macrì, P., Scarponi, D., Ferretti, P., Bellini, G., Dalan, G. - The Valle di Manche section (Calabria, southern Italy): state-ofthe-art recent advances and future perspectives; 8 - Scarponi, D\*., Capraro, L., Huntley, J.W., Macrì, P., Raffi, S. - Stratigraphic variation of molluscan assemblages across the Lower-Middle Pleistocene transition in the Valle di Manche section (Calabria, southern Italy). The presentations mainly focused on a new high-resolution 818O record and its relationship to the M-B boundary in the section, as well as palaeo water depth variations between MIS 23-19 as evidenced by changes in the composition of benthic macro-invertebrate assemblages.

2.4 The last group of presentations were as follows: : 9 - Okada, M.\*, Kazaoka, O., Suganuma, Y\*., Kameo, K., Head, M.J., Yoshida, T., Nishida, N., Ogitsu, I., Nirei, H., Aida, N., Kumai, H. -

continental environment; 11 - Giaccio, B., Nomade, S.\*, Sagnotti, L., Zanchetta, G., Renne, P., Scardia, G., Drysdale, R.N., Tzedakis, P.C., Sottili, G., Sprain, C., Sposato, A., Scao, V., Bassinot, F., Messina, P. - The Lower-Middle Pleistocene contribution to a high resolution record of the Sulmona palaeolake (Abruzzes, Italy).

#### 3. Field trip programme

The field trip took place over two days. The first day was spent in Basilicata, and was devoted to visiting the Montalbano Jonico succession, which is well-exposed along the internal border of the Apennines Foredeep. southern Particular attention was dedicated to the "Ideale Section", deposited during the MIS 20-18 interval (Figs. 10, 11). The day was concluded with a short visit to the San Lorenzo continental succession in the Sant'Arcangelo Basin. The second day was spent visiting the Valle di Manche section, near the village of San Mauro Marchesato in Calabria.

3.1 October 12th. The village of Montalbano Jonico overlooks a breath-taking panorama of the surrounding badland landscape; a protected area noted for its natural history as well as geological value. Along the steep western slope of Montalbano, a Lower-Middle Pleistocene composite section, about 450 m thick, has been reconstructed (Ciaranfi et al., 2001; 2010). It extends from MIS 37-16 (from 1240 ka to 645 ka BP) and consists of mudstones and muddy silts, from an upper slope to shelf environment, which includes nine volcaniclastic layers (V1-V9). One of the partial sections, the Ideale Section (Fig. 10), contains the transition between the Lower-Middle



opercularis

Discospirina-Nassarius maximum depth

V3, V4 volcaniclastic layers

Fig. 11. Partial section of Montalbano Ionico succession and main palaeontological and The Ideale Section at Montalbano Jonico allows chronostratigraphic constraints.

Lithology and chronostratigraphy of the marine sequence at the Chiba section, central Japan: a well-exposed Lower-Middle Pleistocene boundary succession; 10 - Sabato, L.\* - The San Lorenzo lacustrine succession in the Sant'Arcangelo Basin (South Italy): a wonderful record of the Early-Middle Pleistocene in a

Pleistocene (Marino et al., 2015). In its upper part, the δ18O record, calcareous nannofossil biostratigraphy and climatic-palynological data indicate the location of MIS 19 (including substages 19.1, 19.2 and 19.3), which is approximately the position of the M-B reversal, assumed to be

close to the V4 layer (40Ar/39Ar dated 773.9  $\pm$  1.3 ka, Petrosino et al., 2014) and very close to MIS 19.2. Although the Ideale Section does not record the M-B reversal (Sagnotti et al., 2010 and references within), it does contain multiple palaeoenvironmental and chronostratigraphical constraints, and it represents a suitable sequence for the selection of the Ionian Stage and the Middle Pleistocene Subseries GSSP.

The San Lorenzo lacustrine succession (up to 200 m thick) is well-exposed in the eastern part of the Sant'Arcangelo Basin (Fig. 12), and is mainly composed of silty claystones with interbedded carbonates and tephra layers (Sabato et al., 2005 and references within). Preliminary palinological data show cyclic vegetational changes that may be correlated with glacial/interglacial phases (Sabato et al., 2005), and sedimentary structures indicate low energy environments occasionally affected by density currents (Moretti and Sabato, 2007). The K-Ar radiometric dating of tephra and the middle Galerian age of vertebrate remains indicate the succession is of Early-Middle Pleistocene (transition) age, coeval to one of the more recent evolutionary phases of the Sant'Arcangelo Basin (Onofrio et al., 2009). Furthermore, along the succession, the Jaramillo sub-chron and the M-B reversal are recognised.

3.2 October 13th. Along the badlands, just below the cemetery of San Mauro Marchesato, is a 50 m thick exposure of the Valle di Manche stratigraphic section (Fig. 13). It contains the Lower-Middle Pleistocene transition that, based on new marine oxygen isotope stratigraphy, shows the M-B reversal located just below the peak of MIS 19. From a lithological and palaeoenvironmental perspective the sediments around interglacials MIS 21 and MIS 19 consist of outer-shelf mudstones alternating with shallowing-upward silts and sandy silts. The tephra layer, called the Pitagora ash, corresponds to MIS 19 and is close to the M-B reversal: this tephra is a torbiditic level (Capraro et al., 2014), resedimented from an older ash fall, and it represents a highly visible local marker bed.

palaeoenvironmental Stratigraphic and differences between the Montalbano Jonico and Valle di Manche sections currently prevent their robust correlation. The respective leaders of the Basilicata and Calabria sections hope to refine their investigations and resolve some of these differences at the XIX INQUA Congress when the latest research on all three candidate sections for GSSP consideration, including the Chiba section, will be presented.

#### 4. Concluding remarks

the following: i) detailed foraminiferal and nannofossil biostratigraphy, ii) accurate palaeoenvironmental reconstruction based on micro- and macrobenthic invertebrate fauna, robust pollen (Bertini et al., 2015) and ostracods (Aiello et al., 2014), iii) benthic and planktonic δ18O stratigraphy that clearly

#### A T E R N A R Y P E R S P E C T I V E

References



Fig. 12. Spectacular outcrop of lacustrine San Lorenzo succession in Sant'Arcangelo Basin. The white levels mark main tephra layers.

identifies MIS 19 and sub-stages (19.1, 19.2, 19.3), iv) astronomical calibration, and v) two 40Ar/39Ar dated tephra layers (V3 and V4) (Ciaranfi et al., 2010; Maiorano et al., 2010; Petrosino et al., 2014; Marino et al., 2015) bracketing MIS 19. Furthermore, the Montalbano Jonico section, together with the Vrica section in Calabria, cover the entire Calabrian time, from MIS 65-37 (Vrica) and MIS 37-19 (Montalbano), thus representing the potential unit-stratotype of the Calabrian Stage (Maiorano et al., 2010; Cita et al., 2012). Good preservation of the section and its easy access are guaranteed because it is located within a "Special Natural Reserve of Montalbano Jonico Badlands" instituted under Law 3/11 of the Basilicata Region.

The Valle di Manche section clearly shows i) the M-B reversal at the base of MIS 19, ii) detailed foraminiferal and nannofossil biostratigraphy, iii) pollen ecostratigraphy, and iv) benthic and planktonic  $\delta$ 18O stratigraphy and chronology around the M-B boundary (Capraro et al., 1995; Rio et al., 1996). Exposures and access are also good, and the Pitagora ash, which is close to the M-B boundary, provides a convenient local marker bed.



Fig. 13. The Valle di Manche section.

The two lacustrine sections of San Lorenzo (Sabato et al., 2005) and Sulmona (e.g. Sagnotti et al., 2014, and references within) were deposited during the Early-Middle Pleistocene transition and they can easily be correlated to the Montalbano Jonico section using well-dated tephra layers and palynological assemblages. These successions lie within close proximity to each other in Italy, and may be considered a reference region for Quaternary chronostratigraphy. They are also not far from the Fronte section (Taranto), which is a potential candidate for the GSSP of the Tarentian Stage (Upper Pleistocene) (Amorosi et al., 2014). Aiello, G., Barra, D. & Parisi, R. (2014). Lower-Middle Pleistocene ostracod assemblages from the Montalbano Jonico section (Basilicata, southern Italy). *Quaternary International*, DOI: 10.1016/j.quaint.2014.11.010.

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EEE Metrics: Parametrisation of Earthquake Environmental Effects -1229P

#### IFG 1228f - Palaeoseismology and Active Tectonics

Project Leaders: Pablo G. Silva (RWTH Aachen University, Germany), Klaus Reicherter (Institut de Physique du Globe de Paris, France), Luca Guerrieri (Istituto Superiore per la Protezione e la Ricerca Ambientale, Italy), Ioannis Papanikolaou (Agricultural University of Athens, Greece).

#### <u>Website</u>

5<sup>th</sup> INQUA International Workshop on Palaeoseismology, Active Tectonics and Archaeoseismology (PATA Days) & 3<sup>rd</sup> Project Meeting in Busan (South Korea), 21<sup>st</sup> – 27<sup>th</sup> September 2014.

**Authors**: Christoph Grützner<sup>1</sup>, Jin-Hyuck Choi<sup>2</sup>, Klaus Reicherter<sup>2</sup>, Pablo Silva<sup>3</sup>.

<sup>1</sup>University of Cambridge, UK, <sup>2</sup>Institut de Physique du Globe de Paris, France, <sup>3</sup>RWTH Aachen University, Germany.

Between 21<sup>st</sup> and 27<sup>th</sup> September 2014, the 5<sup>th</sup> International INQUA PATA Days conference was held in Busan, Korea. Former meetings of this series have taken place in Spain (2009), Greece (2011), Mexico (2012), and Germany (2013). This PATA Days meeting is the first to be held in Asia.

Around 100 scientists from 18 countries participated, among them a large number of ECRs, some of whom were supported by INQUA travel grants.

The meeting focused on the following topics: 1. Earthquake geology; 2. Remote sensing & geomorphology; 3. Archaeoseismology; 4. Palaeoseismology; 5. Active tectonics in Korea; 6. Seismic hazard assessment for critical facilities; and 7. Earthquake environmental effects (EEE). Each topic was introduced by one or more keynote speakers.



Fig. 14: Visiting the nuclear waste deposit site during the field trip.

Pre- and post-meeting excursions in southeast Korea were devoted to active faults, EEE, seismic hazard and critical facilities. The first field trip took participants to uplifted Quaternary marine terraces, to a Nuclear Waste Disposal site (low & intermediate-level radioactive waste disposal facility), and to a monitoring system for an active fault near a nuclear power plant. During the second field trip participants visited active faults along the Yangsan-Ulsan Fault System and a palaeoseismological trench at the northern Yangsan Fault. In addition, earthquake-damaged archaeological sites in the old capital city of Gyeongju were visited.



Fig. 15. Tsunami evacuation routes have been assigned along the east coast, although the tsunami hazard appears to be low compared to Japan.

The meeting was supported by the Geological Society of Korea, the Korea Institute of Geoscience

and Mineral Resources, the Korean Federation of Science and Technology Societies, the Korea and Busan Tourism Organisations, and INQUA. A special volume will be prepared based on selected contributions from ECRs, the latter of whom shall also make up the guest editorial team of the volume. An abstract volume of all peer-reviewed short papers are freely available for <u>download</u>.

The palaeoseismology community have identified major challenges for the future. One problem is that recent moderate earthquakes like Bam (Iran, 2003), L'Aquila (Italy, 2009), Christchurch (New Zealand, 2011), Lorca (Spain, 2011), Emilia-Romagna (Italy, 2012), and Tabriz (Iran, 2012) had fatal consequences and were characterised by relatively large ground motions and strong EEE. However, nothing or little was known about the causative faults before. These events illustrate that there is a need to locate and evaluate active faults even in cases where they do not reach the surface and where secondary effects must be used to identify palaeo-earthquakes. This is even more important in areas where the earthquake recurrence intervals are so long that historic catalogues do not cover the last major events. During the Busan meeting, one focus was remote sensing methods to identify active faults e.g. LiDAR, photogrammetry, and other modern imaging tools to qualitatively and quantitatively

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describe tectonic geomorphology. In addition, the need for further development of the ESI-2007 scale was emphasised and new approaches were presented. The EEE metrics project is an important contribution for making geological information on past earthquakes more valuable to hazard assessments.



Fig. 16. Workshop participants visit an active thrust fault in SE Korea.

Another unsolved issue is that very large earthquakes with dramatic impact e.g. Sumatra (Indonesia, 2004), Kashmir (Pakistan, 2005), Sichuan (China, 2008); Haiti (2010), and Tōhokuoki (Japan, 2013) have occurred in areas where the seismic hazard was known to be high - and yet still the consequences exceeded the worst case scenario. In Busan, palaeoseismologists presented the latest results on how to better understand the earthquake cycle, how to better constrain recurrence intervals and slip rates, and how to estimate palaeomagnitudes. The 2013 Japan earthquake and tsunami demonstrate that cascading effects need to be considered in order to properly assess the hazard that is posed by earthquakes; often, secondary effects like tsunamis, liquefaction and landslides have a more dramatic impact than the seismic shaking itself.



Fig. 17. Raquel Felix won the Outstanding Student Paper Award, presented by A.Michetti (left) and K.Reicherter (right).

In Busan there was consensus that the hazard posed by primary surface faulting needs to be more properly addressed than current practice allows. It was decided that efforts should focus on i) minimum magnitudes for surface ruptures, ii) Probabilistic Fault Displacement Hazard Analysis (PFDHA), and iii) EEE mapping and parametrisation. Two important steps in that direction are the growing <u>EEE catalogue</u> hosted by the Institute for Environmental Protection and Research (ISPRA) and the <u>Earthquake Geo Survey</u> <u>App</u> for Android developed by V.Kopsachilis and G.Papathanassiou.



Fig. 18. Workshop participants visit a palaeoseismological trench.

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## G@GPS: Groundwater and global palaeoclimate signals - 1309F

Project Leaders: Jianyao Chen (Sun Yatsen University, China), Dioni I. Cendón (Australian Nuclear Science and Technology Organisation, (ANSTO), Australia), Sylvi Haldorsen (Norwegian University of Life Science, Norway).

#### **Website**

INQUA-G@GPS Annual Meeting: Groundwater and Environmental Change - The international Workshop and Training Course, 8<sup>th</sup> -13<sup>th</sup> December 2014, Zhanjiang (China).

Authors: Jianyao Chen<sup>1</sup>, Dioni I. Cendón<sup>2</sup>, Sylvi Haldorsen<sup>3</sup>, Jason Gurdak<sup>4</sup>.

<sup>1</sup>Sun Yatsen University, China; <sup>2</sup>ANSTO, Australia; <sup>3</sup>Norwegian University of Life Science, Norway; <sup>4</sup>San Francisco State University, USA.

Although palaeoclimate information from groundwater provides an inherently low resolution record, groundwater may have the potential to provide a regionally integrated proxy of climatic variations at the times of recharge. The major task of G@GPS IFG is to identify the recharge periods of the large groundwater aquifers worldwide. The main aims are to: 1) Use isotopic and geochemical data from large aquifers to estimate recharge times and palaeorecharge temperatures. The IFG initially targeted one or two emblematic aquifers ("flag basins") in most continents. After two years the number of basins targeted has increased (see www.gw-gps.com) as new collaborations and research IFGs have been developed. 2) Compare and potentially correlate major climatic events derived from groundwater basins with those obtained from higher resolution continental proxy records. This will be done at a continental scale (individual basins) and global scale (between different basins). 3) Discuss and improve the methods of age determination and palaeoclimate interpretation based on

groundwater signals (e.g. stable and radioactive isotopes, noble gases, other geochemical parameters).



Fig. 19. G@GPS Workshop at Zhanjiang Bureau of Hydrology.

In the past four years, three workshop and training courses have been held: one session at the XVIII INQUA Congress (Bern) and three side events at the International Association of Hydrogeologists (IAH) Congress in Niagara Falls, Perth, and Marrakech. Two additional funding projects were secured "G@GPS-Africa: Long-term recharge of large groundwater basins" from ICSU and "Palaeoclimatic information obtained from past-recharged groundwater in large basins and correlations at global scale" from the IGCP (project 618, 2012-2016). Palaeoclimate signals from the flag basins were collected and compared with other relevant records at a continental scale. Groundwater age extended from around 40-50 ka (14C) to 1 Ma (81Kr) BP. Comparison at a global scale is the focus of the proposed workshop (website) in Tallinn in 2015, and more efforts in groundwater dating by 81Kr in flag basins will definitely improve palaeogroundwater research.



Fig. 20. Participants at the INQUA-G@GPS Workshop and Training Course.

The aims of the INQUA-G@GPS annual meeting (Zhanjiang, Guangdong Province, China) were as follows: 1) Present new research progress within the G@GPS group in 2014. 2) Organise a training course with emphasis on the application of <sup>13</sup>C, <sup>14</sup>C and <sup>81</sup>Kr in groundwater dating, particularly in the humid area in South China. The groundwater samples collected during the training course will be analysed for a comparative study of palaeoclimatic signals between the humid and semi-arid/arid areas (e.g. North China Plain (NCP)). Sample collection for <sup>81</sup>Kr in groundwater was explained and demonstrated. Potential uses on other continents were discussed. 3) Discuss

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future activities: new ideas, meeting proposals (e.g. XIX INQUA Congress), and possible academic exchange between staff and students. The workshop and training course in Zhanjiang was organised by Sun Yatsen University with 22 participants from five countries (Australia, Bangladesh, China, Japan, and Tunisia). ATTA (Atom Trap Trace Analysis) for <sup>81</sup>Kr and <sup>85</sup>Kr was, for the first time, introduced in the G@GPS meeting, and S.Hu from University of Science and Technology, China (USTC), an expert on ATTA, was invited as a lecturer to attend the meeting. In the field training of groundwater dating methods, seven water samples from an aquifer depth of more than 200 m in Leizhou Peninsula were collected for 14C, 81Kr and 85Kr. 14C was analysed by ANSTO, and <sup>81</sup>Kr and <sup>85</sup>Kr by USTC. By testing groundwater age using different methods groundwater dating is to be extended from around 40-50 ka (using <sup>14</sup>C) to 1 Ma (using <sup>81</sup>Kr) BP. The annual meeting was funded by INQUA, IGCP and NSFC (Natural Science Foundation of China), and the Zhanjiang Bureau of Hydrology provided support.

#### INQUA Peribaltic Working Group Meeting and International Field Symposium Quaternary Geology and Modern Questions

#### **The Netherlands**

#### 2<sup>nd</sup> - 8<sup>th</sup> November 2015

#### Organisers

Utrecht University, Province of Drenthe, TNO Geological Survey of the Netherlands, University of Groningen, Radboud University Nijmegen, Wageningen University, Royal NIOZ (Netherlands Institute for Sea Research), INQUA Peribaltic Working Group (TERPRO), INQUA Netherlands Committee.

#### **Organising Committee**

Enno Bregman, Kim Cohen, Wim Hoek, Freek Busschers, Lena Smit and Judith Anneveldt.

#### Format and venue

The Organising Committee provides one day for oral and poster presentations (5<sup>th</sup> November, 2015) and a four-day field excursion:

- Participants arrive at Utrecht on Monday 2<sup>nd</sup> November (21:00 ice-breaker party, NHHotel, Utrecht).
- Tuesday 3<sup>rd</sup> November field excursion by bus, via Texel (NIOZ), to Assen (Drenthe).
- From Tuesday evening to Friday morning 6<sup>th</sup> November, we will stay at Assen. Wednesday 4<sup>th</sup> November - field excursion to GeoPark Hondsrug and other sites. Thursday 5<sup>th</sup> November - conference day, hosted at Province House of Drenthe, Assen.
- Friday 6<sup>th</sup> November field excursion by bus, via IJssel valley and Veluwe, to Utrecht.
- From Friday evening to Sunday morning 8<sup>th</sup> November, we will stay in Utrecht. Saturday 7<sup>th</sup> November - visit to TNO Geological Survey of the Netherlands, Utrecht.
- Participants depart from Utrecht on Saturday evening or on Sunday 8<sup>th</sup> November.

#### Abstract for oral and poster presentations

Colleagues are invited to submit abstracts relevant to the topic of the Symposium.

The conference day will be organised in four sessions. We request abstracts for oral and/or poster contributions on four themes:

- North Sea and Baltic coasts;
- Periglacial landscapes;
- Glaciated landscapes and their hydrology;
- Human impact on landscape, past and present.

A general poster session is hosted to cover further contributions.

The conference and excursion programme schedule include additional invited talks on:

- Science and policy implementation;
- Geoheritage sites in practice;

Depending on the number of abstracts received, the Organising Committee may ask participants to transfer proposed oral presentations to a poster contribution. Time for discussing oral and poster contributions is reserved as part of the programme. The conference day is also open to Dutch colleagues, and other colleagues from abroad, who may have an interest in the presentations. We will invite them separately. Abstracts will be published in a special conference volume and should not exceed two A4 pages (12 pt, single line spacing) including figures (blackand-white or colour) and references. Details of formatting proceedings will be included in the second circular (15<sup>th</sup> June 2015).

#### Registration

If you are interested in participation please return the preliminary registration form via email before the 29<sup>th</sup> May 2015 to Judith Anneveldt (<u>i.anneveldt@drenthe.nl</u>).

#### **Registration fee**

The registration fee is preliminarily set at 400 EUR. The fee covers field trip transportation, conference materials, accommodation (Utrecht, Assen), full-board Tuesday 4<sup>th</sup> to Saturday 7<sup>th</sup> November. The final symposium fee depends on the total number of participants. The number of participants on the field symposium is limited ~50 persons (one touring car bus). Please note that the registration fee does not cover any health or travel insurance and accommodation before and after the excursion. Dinners on the arrival day (Monday 2<sup>nd</sup>) and on the departure weekend (Saturday 7<sup>th</sup> and Sunday 8<sup>th</sup>) are not included in the fee.

#### **Important deadlines**

Pre-registration – 29th May 2015

Second circular – 15th June 2015

Submit abstracts - 15th July 2015

Pay registration fee – 15<sup>th</sup> August 2015

**More information** will be provided to those who register in the second circular. Official invitations that may be necessary in case participants need to apply for visas will be sent to participants upon request. For any additional information please do not hesitate to contact Enno Bregman (enno.bregman@gmail.com).

Applied Quaternary geology

#### UATERNARY PERSPECTIVES

### OBITUARIES

### In memoriam Jean-Claude Flageollet



J.-C. Flageollet at the IAG symposium Dornbirn, Austria, July 2002.

Jean-Claude Flageollet passed away on 28<sup>th</sup> November 2014 after battling courageously against disease for over four years. He will be greatly missed; the geomorphologist community is in grieving, as are, more broadly, many French and foreign scientists.

He was born in Gerardmer in 1931 and, at the end of a succession of brilliant academic studies, in 1966 he was awarded the Geography *Aggrégation* degree (French top teaching degree).

In 1967 he became an Assistant Lecturer at the Nancy II (Literature) University. Later in 1976 as a Research Fellow at the Centre National de la Recherche Scientifique (CNRS) at Nancy I (Sciences), he defended a PhD thesis entitled *"Formations superficielles et reliefs d'érosion différentielle dans les Massifs anciens cristallins: l'exemple du Limousin et de la Vendée du Nord-Ouest"* (Superficial formations and differential erosion landforms in ancient crystalline massifs: the example of the Limousin and Northwest Vendée regions) – a thesis he published in 1977.

He was appointed as a Professor at the University of Caen in 1980 and then joined the Strasbourg Louis Pasteur University in 1987, where he held tenure until his retirement in 1996. Since 1997, he had been a Professor Emeritus at the Strasbourg Louis Pasteur University. Among his many administrative and scientific responsibilities, in 1989 he founded the *'Centre Européen sur les Risques Géomorphologiques (CERG)'* (European Centre on Geomorphological Hazards, CERG), with one of the centers belonging to *'Accord Partiel Ouvert sur* 

*les Risques Majeurs (EUR-OPA)* (the Open Partial Agreement on Major Risks (EUR- OPA), in the Council of Europe). He acted as its Executive Secretary from 1989 to 2000, and as President until 2004.

Jean-Claude Flageollet made a great contribution to French geomorphology in both diverse but complementary areas. During his career his work focused on basic and applied research in i) structural and climate geomorphology; ii) dynamic geomorphology, iii) natural hazards (especially landslides); and iv) regional climatology. His geosystemic approaches have made it possible to find answers for both land use and environmental management issues.

His early work focused on research in structural and climatic geomorphology, with particular reference to differential erosion; the nature and origin of superficial formations; and soils in base areas. He charted and described the superficial formations in several 1:50,000 geological maps.

As early as 1983 he specialised in natural hazards, especially landslides. He undertook the mapping of superficial formations of unstable slopes in the coast of the *Pays d'Auge* (Normandy, France). Indeed, he grasped the whole point of geomorphological approaches in order to understand landslides and to map hazards and risks.

In 1988 he published his book '*Les mouvements de terrain et leur prévention*' (Landslides and Prevention), which remains an essential reference for any student. His research was conducted mainly in the French Southern Alps (Barcelonnette Basin, France). He published numerous articles in international journals, as well as conference and convention proceedings, in France and abroad (see his <u>bibliography</u>).

He also worked on 'questions d'aménagement du territoire et d'environnement' / planning and environment issues. In 2003 he published (at Editions du CNRS) a remarkable book on landscapes, with a view to protecting landscape heritage: 'Sur les traces des glaciers vosgiens' (On the trail of the Vosges glaciers). He continued in this direction, looking for extraordinary geological and geomorphologic sites, and taking action for their protection and conservation, especially in the Vosges area (France). He made several educational discovery trails with beautiful panels on the geomorphology and Quaternary of: (1) Gérardmer, around the lake, (2) the Noirgueux moraine, and (3) the Sagard trail in the Straiture Valley. In late 2013 he had the Gérardmer and Noirgueux moraine discovery trails classified as part of our natural heritage, despite vocal reluctance on the part of some scientists and local officials who, since 2009, had been giving priority to a construction project.

Finally, he dedicated his last ten years to the field of regional *climatology* and, in 2005, published a book 'Où sont les neiges d'antan? Deux siècles de neige dans le Massif Vosgien' (Where are yesteryear snows? Two centuries of snow in the Vosges Mountains); then in 2010 'Le réchauffement climatique en Europe, depuis quand? pourquoi?' (Global warming in Europe, since when? Why?). Finally, in 2012 'Atlas régional du réchauffement climatique de 1971 à 2010 (A regional atlas of global warming from 1971 to 2010).

On behalf of his students, his colleagues and fellow Professors, I would like to express our gratitude to Jean-Claude Flageollet for his scientific contribution: he was able to guide and accompany in the field of a subject that he has widely contributed to.

Olivier Maquaire Professor, University of Caen Basse-Normandie

This text was written after his biography and bibliography, available online at: http://www.jean-claude-flageollet.sitew.com/#Curriculum.B

### In memoriam Stephen C. Porter



S.C. Porter at INQUA Congress, Cairns, Australia, August 2007

Stephen C. Porter passed away on 19th February 2015. With his passing the Quaternary lost one of its great champions and influential scientists. Steve will be remembered not only for his science but also for his service to a discipline that he cherished so dearly. He was Vice President of INQUA from 1991-1995 and President from 1995-1999. During that time he led the restructuring of the Executive Committee, which resulted in the organisation becoming more streamlined and better equipped to serve the modern world. In 2011, in recognition of his work on behalf of INQUA, Steve was selected as the first recipient of the Liu Tungsheng Distinguished Service Medal.

Steve graduated from Yale, and following service with the U.S. Naval Reserve, returned for graduate studies. After completing his PhD research on glaciations in the Brooks Range, he joined the faculty of the Department of Earth and Space Sciences at the University of Washington, Seattle. Over his life time he pursued his research from the Arctic to Antarctica and in many of the world's great mountain ranges in between. He was a prolific researcher who published over a hundred papers on glacial geology, geomorphology, and palaeoclimate. He also co-authored several books including *The Blue Planet* and *The Dynamic Earth*, both widely used on college campuses for teaching undergraduates in geology and the environmental sciences.

His talents, however, were broader than research and teaching, and from 1982-1998 he was the Director of the Quaternary Research Centre, a world-class institution, where faculty and students from archaeology, biology, climatology, and geology participated in global studies. His vision of the Quaternary as a multidisciplinary laboratory was nurtured during those years. From 1976-2001 he was Editor of *Quaternary Research*. He also served as Associate Editor and sat on editorial boards for *Quaternary International*, and *American Journal of Science* and *Radiocarbon*. Many young scientists throughout the world will remember communicating with Steve about their first scientific contributions.

He was collegial in every sense of the word and his participation was sought after by many Quaternary organisations in addition to his involvement in INQUA. These included the Board of Governors of the Arctic Institute of North America, National Academy of Sciences (NAC)/National Research Council (NRC) Board on Earth Sciences, US National INQUA Committee, and the American Quaternary Association (AMQUA) for whom he served as President.

For his contributions Steve was recognised by several national and international organisations. In 1998 he was made a fellow of the American Association for the Advancement in Science (AAAS). In 2004 he received the Kirk Bryan Award from Geological Society of America (GSA) and the Distinguished Career Award from AMQUA. In 2005 he was awarded GSA's Quaternary Geology and Geomorphology Division's Distinguished Career Award. In 2007 he was named a prestigious Einstein Professor by the Chinese Academy of Science, and in 2011 he received their award for International Cooperation.

Above all Steve was an incredibly gracious and humble man who never let his accomplishments stand in the way of him being an exceptionally pleasant and charming colleague. He loved people and kept a large collection of photographs of Quaternary scientists all identified by names.

For me, he was one of my favourite Quaternary people and a role model. I will never forget working with him in the field on the Loess Plateau in central China in the 1990s. At times we were mobbed by local people. He had an amazing capacity to communicate even though he did not speak Chinese. His secret, he confided in me, was to smile and to talk as if he had just met some long lost friends. It seemed strange but it never failed him.

Our condolences go to his wife Anne who accompanied Steve during many of his travels and who, together with their children Susannah, John and Maria, hosted numerous Quaternary scientists and students at their home in Shoreline, Washington.

Allan Ashworth, University Distinguished Professor Emeritus Quaternary Entomology Lab, North Dakota State University, Fargo, ND 58108, U.S.A. Vice-President for INQUA 2007-2011

#### OUATERNARY PERSPECTIVES OTHER NEWS

#### Humans and Hazards IFG Workshop (HHW).

#### Barnaul, Russia.

#### 2<sup>nd</sup> - 11<sup>th</sup> July 2015

A workshop of the Humans and Hazards IFG will be organised as a side meeting that coincides with the <u>Regional Conference of the International</u> <u>Association of Geomorphologists</u> (IAG) in Barnaul, Russia.

It will include a joint INQUA-IAG session "Geomorphological Hazards in Past and Present" (2<sup>nd</sup> - 4<sup>th</sup> July 2015) and an Intensive Field Course (IFC) in north eastern Altai for ECRs and Quaternary researchers (5<sup>th</sup> -11<sup>th</sup> July 2015) co-organised with IAG.

The IFC will be carried out as a 7-day field trip along the Biya, Katun' and Chuya valleys with the focus on geomorphic and sedimentary traces of the Late Pleistocene glacial lake outburst floods (GLOFs), methods of their identification and quantitative assessment.

#### Journal: Frontiers in Earth Science

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Queries should be directed to: <u>earthscience.editorial.office@frontiersin.org</u>

### uaternary perspective GLOSSARY

AAAS: American Association for the Advancement in Science ABM: agent-based modelling AfQUA: African Quaternary AIQUA: Associazione Italiana per lo Studio del Quaternario ALCCs: anthropogenic land cover changes AMQUA: American Quaternary Association ANSTO: Australian Nuclear Science and Technology Organisation ATTA: Atom Trap Trace Analysis AVECUA: Asociación Venezolana para el Estudio del Cuaternario BELQUA: Belgian Quaternary CENIEH: Centro Nacional de Investigación sobre la Evolución humana CMP: Coastal and Marine Processes Commission (INQUA) DCRs: Developing-Country Researchers ECRs: Early Career Researchers EAPP: East African Association for Palaeoanthropology and Palaeontology EEE: earthquake environmental effects ENM: environmental niche modelling ESI: Environmental Seismic Intensity (scale) FLAG: Fluvial Archives Group GLOFs: glacial lake outburst floods GSA: Geological Society of America GSSP: Global Boundary Stratotype Section and Point HABCOM: Humans and Biosphere Commission (INQUA) HEREGO: Heritage, Resources and Governance HHW: Humans and Hazards Workshop IAG: International Association of Geomorphologists IAH: International Association of Hydrogeologists ICS: International Commission on Stratigraphy ICSU: International Council for Science IFC: Intensive Field Course

IFG: International Focus Group

IGBP: International Geosphere-Biosphere Programme

IGC: International Geological Congress

IGCP: International Geoscience Programme

IRD: Institute for Research and Development

ISPRA: Institute for Environmental Protection and Research

IYPE: International Year of Planet Earth

M-B: Matuyama-Brunhes (boundary/transition)

MPR: Mid-Pleistocene Revolution

NAC: National Academy of Sciences NIOZ: Netherlands Institute for Sea Research NMK: National Museum of Kenva NQMDB: Neogene-Quaternary Mammals Database NRC: National Research Council NSFC: Natural Science Foundation of China PAGES: Past Global Changes PALCOMM: Palaeoclimate Commission (INQUA) PAREGO: Patrimoines, Ressources, Gouvernance PATA: Palaeoseismology, Active Tectonics and Archaeoseismology PFDHA: Probabilistic Fault Displacement Hazard Analysis QI: Quaternary International QP: Quaternary Perspectives ROAD: ROCEEH Out of Africa Database ROCEEH: Role of Culture in Early Expansions of Humans SACCOM: Stratigraphy and Chronology Commission (INQUA) SANC: South African National Committee SASQUA: South African Society for Quaternary Research SCAR: Scientific Committee on Antarctic Research SEQS: Section (formerly 'Sub-Commission') on European Quaternary Stratigraphy SQS: Sub-commission on Quaternary Stratigraphy SIS: Scandinavian Ice Sheet SPC: Science Programme Committee TERPRO: Terrestrial Processes, Deposits and History Commission (INQUA) UISPP: Union Internationale des Sciences Préhistoriques et Protohistoriques USNC: United States National Committee USTC: University of Science and Technology China WG: Working Group YD: Younger Dryas