



Australasian Quaternary Association Inc.

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AQUA



2006 AUSTRALASIAN-INTIMATE Meeting

University of Canterbury
Edward Percival Field Station
Kaikoura, South Island
New Zealand

Wed 29th Nov - Thu 30th Nov

MINUTES OF MEETING

A summary of the meeting, based on notes recorded by David Barrell, is provided below. Those attending the meeting were: Peter Almond, David Barrell, Tim Barrows, Martin Brook, Phil Burge, Michael Evans, David Fink (Day 2 only), Olivia Hyatt, Darren King, Ed Rhodes, Jamie Shulmeister (convener), Greg Skilbeck, Phil Tonkin, Marcus Vandergoes, Paul Williams and Craig Woodward.

DAY 1: WEDNESDAY 29TH NOVEMBER:

INTRODUCTION

Jamie Shulmeister opened the meeting at 10 am, with an introduction, emphasising the primary aim of defining a draft Australasian climate event stratigraphy (CES) for presentation at the INQUA 2007 Congress. The idea of selecting a 'benchmark' climate record (e.g. an Antarctic ice core), against which to present the Australasian CES was discussed. Points raised included:

- that some sort of composite benchmark may be better (Barrell)
- that it may be worth developing the CES initially by considering Ice core, Marine and Terrestrial elements separately, and then integrating the result (Barrell)
- that it is essential to resolve the evidence from the NZ region records first, and then extend to wider areas (Williams)

The convener asked whether the group would agree that ultimately there is a need to draw links between the Australasian CES and the Antarctic ice cores, to facilitate connection to North Atlantic records. Agreement was indicated. Jamie Shulmeister added that it is important that we retain a view of an Antarctic CES throughout the exercise of compiling an Australasian CES (covering at least the mid-latitude westerly wind belt of Australasia).

DEVELOPMENT OF EVENT STRATIGRAPHY

For developing the 30 to 8 ka CES, Jamie Shulmeister spoke of the need to focus on proxy records from which climate parameters can be derived via transfer functions. An example is the derivation of mean summer temperature from chironomid records. It was noted (Williams) that some other proxies may not give direct climate parameters, but do provide important contextual or directional information on climate parameters.

Extensive discussion followed on the nature of the various climate proxies:

It was suggested (Barrell) that any new proxy records that are tabled need to be accompanied by adequate documentation of age control, etc, at least analogous to what was done for the records presented in the NZ-INTIMATE 2005 poster.

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It was noted (Shulmeister) that we probably need to compile an updated poster of the NZ proxy records

Jamie Shulmeister emphasised that we should not regard the Australasian CES as a final product, but simply as a conceptual framework that helps focus future research effort into an improved understanding of how climatic processes work.

OUTLINE OF EVENT BOUNDARY RECOGNITION

Peter Almond summarised the idea that climate events can be regarded either as pulse events (where a climatic excursion ends with conditions similar to those prevailing at the start of the excursion) or step events (where there is a progressive change in climatic conditions).

- It was noted (Barrell) that defining boundaries is important, for instance the ACR is defined in time as the start and culmination of a pulse event, whereas the YD is defined in time as the nadir of climate conditions during a pulse event.
- It was noted (Almond) that pulse events were more likely to be identifiable in high resolution records, with step events more commonly detected in lower-resolution records. Also noted was a point raised previously by Pat Suggate that there can be a combination of pulse and step events, where small-scale pulse events are contained within a larger-scale step event.
- Proposed (Shulmeister/Williams) that in Australasian climate records, we take the limits of a pulse event to be the start and end of that event.
- Noted (Shulmeister) that David Fink will be presenting further thoughts on this issue on Day 2, and that we should also check what approach was used in North Atlantic INTIMATE and mirror that.
- Noted (Barrows) that statistical methods are often used for event recognition to ensure a robust/reproducible result, and also that we should check international stratigraphic conventions on event recognition.

The question of time-transgressiveness of climate events was also raised.

Jamie Shulmeister moved that we shelve the discussion so that the North Atlantic approach, stratigraphic rules, etc, can be consulted, in conjunction with David Fink's presentation on Day 2.

RESEARCH PRESENTATIONS

Ed Rhodes, Kat Fitzsimmons, Cynthja Bolton & John Magee – Central Australian palaeoenvironments of the last 30,000 years – evidence from dune building.

- No major issues were raised in discussion.

Martin Brook & Tyne Crow – Glaciation of the Tararua Range, North Island, New Zealand.

- Apart from surprise from some in the audience that some other workers have expressed doubt about the glacial origin of a suspected moraine in the Park Valley, no major issues were raised in discussion.

Jamie Shulmeister, Olivia Hyatt, David Fink, Henrik Rother, Uwe Rieser & Mike Evans – Glacial timing in the Rakaia and other eastern valleys.

- No major issues were raised in discussion.

Marcus Vandergoes, Rewi Newnham & George Denton - Anatomy of LGM climate change in Southern New Zealand: High resolution chronology from Galway tarn, south Westland.

- Several commented favourably on the clarity, consistency and high-resolution of the results from this site. No major issues were raised in discussion.

Phil Burge & Jamie Shulmeister - Beetles versus Pollen – A 16,000 year record from Westport.

- No major issues were raised in discussion.

P.W. Williams, H. Neil, D.T. King & J. X. Zhao - Towards a quantitative calibration of stable isotope signals from New Zealand Speleothems

- Phil Tonkin noted that the difficulty of making unique climatic interpretations from the isotope records in speleothems might limit their usefulness as a ‘benchmark’ record. Paul Williams concurred that the speleothems provide contextual rather than direct information on climate parameters, but emphasised that they do record clear changes and are extremely well dated. Barrows noted that temperature estimates from speleothems have a minimum error of 3 °C.

Time was allowed to examine and discuss the poster by Olivia Hyatt, Jamie Shulmeister, Glenn Thackray & David Evans - Glacial geomorphology of the middle Rakaia valley, Canterbury, New Zealand.

Session closed at 6.10 pm.

DAY 2: THURSDAY 30TH NOVEMBER:

Session opened at 9 am.

RESEARCH PRESENTATIONS

Greg Skilbeck, David Fink, Mike Gagan & Bert Rein - Interannual record of El Nino-Southern Oscillation over the last deglaciation from the Peru Continental Margin.

- Jamie Shulmeister noted that, based on the information coming to light, he is increasingly uneasy about using only an Antarctic ice core record as a benchmark for an Australasian CES, because of the dual influences, in mid-latitude regions, of both tropical and Antarctic influences.
- No other major issues were raised in discussion.

Craig Woodward, Marcus Vandergoes, Ann Dieffenbacher-Krall, Rewi Newnham, George Denton - New Zealand chironomid-based temperature transfer functions: progress and future directions. (The presentation was given jointly by Craig Woodward and Marcus Vandergoes).

- David Barrell asked for clarification of the point that the variations in chironomid fauna can be ‘mostly’ explained by summer temperatures, when approximately 5 important variability factors were given. Craig/Marcus said that summer temperatures explain about 30% of the total variance, which is regarded as a good level of explanation.
- No other major issues were raised in discussion.

AQUA VICE-PRESIDENT NOMINATION

Time was taken to discuss the filling of the Vice-President role, left open by Brent Alloway’s departure from New Zealand. Two nominations were submitted:

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- Jamie Shulmeister (moved Paul Williams, seconded David Fink)
- Peter Almond (moved Phil Tonkin, seconded Tim Barrows)
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It was agreed that both names be forwarded to the AQUA executive committee, for their consideration.

RESEARCH PRESENTATIONS

Timothy T. Barrows, Scott. Lehman, L. Keith Fifield & Patrick De Deckker – Absence of cooling during the Younger Dryas Chronozone in the South Pacific Ocean.

- No major issues were raised in discussion.

As an addition to the official list of presentation, Peter Almond gave a brief overview of the evidence for precipitation variations in the last 30,000 years, based on dating of subsoil carbonates at Ahuriri quarry, Birdlings Flat, Banks Peninsula, Canterbury, New Zealand.

- No major issues were raised in discussion.

INCORPORATION OF NEW CLIMATE PROXY RECORDS

During the period from 12 noon to 3 pm, participants divided into smaller groups to discuss and draw up summaries of recently obtained proxy records.

ANTARCTIC CLIMATE EVENT BOUNDARY RECOGNITION

David Fink presented a method for identifying climate events in Antarctic ice cores. This involved computer analysis of the isotope curves to identify 'break points' in the records. The analytical results were compared to the scheme developed by Chris Turney at the end of the February 2006 Australian INTMATE meeting based on a subjective subdivision of ice core proxy curves.

- There was general discussion on the break point analysis method and implications.
- David Barrell suggested that the NZ-INTIMATE ice core specialist, Nancy Bertler, be consulted on the matter, if possible, given her present involvement in Antarctic field work.
- The end agreement was to continue with the piecewise minimisation approach to identify (mathematically) an ES defined by breakpoints that reflect major changes in Antarctic conditions without recourse to continental proxy records. This should progress together with other CES options (such as the 'white-board' mosaic and/or the Turney CES).

DRAFT NEW ZEALAND CLIMATE EVENT STRATIGRAPHY

David Barrell noted that a working summary of the major climate phases recorded in the NZ proxy records (as presented in the 2005 NZ-INITMATE poster) is given in the paper on the NZ-INTIMATE records currently in press with JQS. It was agreed that this framework form part of the following discussions. This framework, along with summaries of some existing records and those of new proxies were drawn on the whiteboard at the meeting venue.

New proxy records included:

Beetles from Westport, northwest South Island (Phil Burge)

Phil Burge noted that the record is not well dated prior to 28 ka

Chironomids from South Island (Craig Woodward & Marcus Vandergoes et al)

Pollen records from Galway Tarn, western South Island (Marcus Vandergoes et al)

Eastern South Island soil carbonates (Peter Almond et al)

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Cosmogenically-dated glacial sequences, South Island (Barrows et al. Jamie Shulmeister et al)

Climate parameters derived from proxies included:

NZ sea surface temperatures (Tim Barrows et al)

Temperatures from northwest South Island speleothems (Paul Williams et al)

Precipitation from northwest South Island beetles (Phil Burge)

Temperatures from western South Island pollen (Marcus Vandergoes et al)

The series of events was drawn up amidst discussion and general agreement of the participants. See attached summary jpegs (photo of whiteboard; and the draft scheme drawn up on a partial template of the NZ-INTIMATE poster):

PLANNING FOR INQUA 2007

Proposed by Jamie Shulmeister that updated data papers and posters be prepared for both NZ-INTIMATE and OZ-INTIMATE, David Barrell was nominated by Jamie Shulmeister to facilitate NZ data. The role of leader for the OZ data collation is open for volunteers.

Proposed by Jamie Shulmeister that these be accompanied by a joint Australian-INTIMATE draft CES paper. Suggested that it should be jointly presented by one NZ-INTIMATE and one OZ-INTIMATE representative. Two nominations were put forward: Paul Williams (moved Jamie Shulmeister) and Tim Barrows (moved Peter Almond).

Paul Williams suggested that if possible the Australasian-INTIMATE papers be programmed for presentation early in the congress, as this will set the scene for many other Australasian research presentations.

Jamie Shulmeister emphasised that as many as possible of the data records compiled into INTIMATE should be presented as individual papers at the conference.

Jamie Shulmeister volunteered to circulate a discussion paper to all members on these proposals.

There was debate on whether there should be a specific AQUA session at INQUA, to make up for the lack of an AQUA conference in 2007. Several views were expressed, to the effect that INQUA should more than make up for the lack of an AQUA conference, and that it would create confusion as to which sessions papers are best presented at, and in such case would dilute the overall impact of papers from Australasian researchers. Barrows noted that a specific Australasian AQUA session (not as specific as INTIMATE which precludes most people) would showcase Australian-New Zealand research.

FUTURE OF AUSTRALASIAN-INTIMATE

The convener introduced this final session in order to debate 'where to from here?'

Jamie Shulmeister proposed that the Australasian-INTIMATE initiative should continue beyond the INQUA conference of 2007. There was general agreement. He further recommended that the first step should be an extension to South America, and if so, he suggested that a new name might be Southern Oceans-INTIMATE. If there is interest from South African researchers, extending the project to there would be a logical step.

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Jamie went on to say that with the compilation of Australasian records well advanced, would it now be a good time to move the focus of effort towards climatological factors controlling climate?

- Phil Tonkin noted that there were still many outstanding gaps in knowledge with regard to various aspects of the proxy data, and there is still urgent need for refining and addressing these gaps.
- Marcus Vandergoes noted that there was now an increasing need for papers outlining our current practices with regard to for data analysis and interpretative protocols.

Jamie asked whether there were any other areas/themes towards which INTIMATE should move. Ed Rhodes raised the possibility of putting together a 'supergroup' of high-profile researchers with the aim of winning funding to support the research initiatives; this could be directed either at usual funder level or at the next level up, directly to government (e.g. the example of the ANDRILL project). Jamie Shulmeister expressed reservations about anything pitched at normal 'funder' level in NZ, because of issues of flat funding and internal competition for the available money.

David Barrell said that in planning the future work, we all should be alert for political issues overtaking the pace of funded research. Climate change in New Zealand has in last 2 months become openly discussed, and reported in media, by all political parties, and is poised to become a major political issue.

- Jamie Shulmeister suggested that we should issue a press release from this meeting (a possible title including: 'New insights into extreme climate variability?'). Jamie to look into and co-ordinate.
- David Barrell suggested that the name 'INTIMATE' would probably be disadvantageous to the group if we are to seek a higher profile via press releases, etc, and it was suggested that we develop a new 'publicity' name for the group and its aims. Jamie to co-ordinate suggestions on this.

Paul Williams called for a round of thanks for the meeting organisers (convener and student helpers) and the meeting was declared closed at 5.45 pm.

ILLUSTRATIONS

Group photo – meeting participants

Photo of draft Climate Event Stratigraphy constructed on the meeting room whiteboard

