

# PALAEOCLIMATE COMMISSION

## **PALCOMM Mission**

The overall objective of PALCOMM is to enhance understanding of Quaternary climatic perturbations, transitions and abrupt events through the combined use of observations and modelling. PALCOMM has emphasized the need for quantitative reconstructions of climate and environmental parameters. PALCOMM has worked towards a closer integration of observationalists and modelers in order to (a) promote the use of climate models in hypothesis-testing mode, and specifically the design of experiments to address the specific challenges posed by the observations, and (b) the use of Quaternary records to evaluate the performance of the climate models used to predict future climate changes. Further details on PALCOMM's remit and activities can be found at <http://www.geol.canterbury.ac.nz/PALCOMM/index.html>.

## **PALCOMM Officers**

*President:* Sandy P. Harrison (originally at University of Bristol, UK and currently at Macquarie University, Australia)

*Vice-President:* Peter Kershaw (Melbourne, Australia)

*Secretary:* James Shulmeister (originally at Christchurch, New Zealand and currently at University of Queensland, Brisbane)

## **PALCOMM Full Members**

Ayako Abe-Ouchi (Japan), climate modelling, responsibility for link to PMIP and PCMIP  
Marion Bamford (RSA) Link with African Quaternarists and the archaeological community  
South Africa  
Patrick Bartlein (USA), data-model comparisons, link with PMIP  
Juan Carlos Berrio (UK), pollen, South American palaeo-records  
Ed Cook (USA), tree-rings, high resolution terrestrial records  
Michel Crucifix (Belgium), climate modeling, link with PMIP  
Anne de Vernal (Canada), marine palaeo-records  
Marie-Jo Gaillard (Sweden), pollen, human impact, link with PAGES Theme 4  
Valerie Masson-Delmotte (France), ice core records  
Lewis Owen (USA), glacial records  
Olga Solomina (Russia), palaeoclimate reconstruction, link to PAGES  
Pinxiang Wang (China) marine palaeo-records

## **PALCOMM Corresponding Members**

PALCOMM corresponding membership is open to any Quaternary scientist working on the reconstruction of past climate changes and the mechanisms underlying these changes. There are ca 280 corresponding members from 36 different countries (Table 1), many of whom are associated with one of the Commission's projects or IFGs.

Country	No. members	Country	No. members	Country	No. members
Argentina	1	Germany	28	New Zealand	15
Australia	32	Iceland	1	Norway	4
Austria	1	India	4	Portugal	2
Belgium	2	Indonesia	1	Russia	3
Brazil	2	Israel	1	Slovenia	1
Canada	5	Italy	13	South Africa	1
Chile	2	Japan	11	Spain	4
China	17	Kenya	2	Sri Lanka	1
Colombia	1	Sth Korea	1	Sweden	8
Denmark	7	Lithuania	1	Switzerland	4
Finland	1	Mexico	1	U.K.	43
France	19	Netherlands	7	U.S.A.	39

Table 1: Number of PALCOMM corresponding members and country in which they are based [\(to be up-dated in time for Bern Congress\)](#).

### **PALCOMM Newsletters.**

The main vehicle for communication with the broader PALCOMM community has been through electronic newsletters. This mechanism was inaugurated in 2008 and we have issued 3-4 newsletters per year since then. The main focus of the newsletters has been on disseminating information about the activities of PALCOMM's IFGs and projects, but this has also been a tool for encouraging participation in the activities of the *Palaeoclimate Modelling Intercomparison Project* and providing information about the inclusion of palaeoclimate research in the upcoming Assessment Report (AR5) of the *Intergovernmental Panel on Climate Change (IPCC)*.

### **PALCOMM activities to promote integration with the modeling community**

A major goal of the PALCOMM officers has been to promote a close and sustained partnership between observationalists (as represented by members of the INQUA community) and palaeoclimate modelers (as represented by the *Palaeoclimate Modelling Intercomparison Project, PMIP*). This has been given increased impetus because palaeoclimate simulations (specifically the Last Glacial Maximum, the mid-Holocene and the last millennium) are included as Tier 2 simulations (i.e. highly recommended) in the current *Coupled Modelling Intercomparison Project Phase 5 (CMIP5)* protocols and can therefore be included in the assessment of model performance in the upcoming Assessment Report (AR5) of the IPCC. PALCOMM has sought to achieve this goal through:

- promoting an ongoing and in-depth dialogue between the modelling community and the INQUA community to facilitate a more robust approach to understanding past climate and environmental changes;
- recruiting two modelers as Full Members of PALCOMM, in order to provide links with PMIP and its sister project PCMIP (the *PalaeoCarbon Modelling Intercomparison Project*);
- Setting up two projects (0801, 0905) which explicitly address the data synthesis activities required by PMIP and PCMIP;
- promoting the explicit incorporation of modeling activities within other PALCOMM IFGs and projects. Most of the projects now make explicit how their activities contribute to ongoing modeling activities, and include modelers amongst their membership;
- facilitate communication between PALCOMM and PMIP through the publicising of ongoing activities in the PALCOMM newsletter and on the PALCOMM web site;
- ensuring that PMIP and PCMIP activities will be showcased at the INQUA Congress. There will be a session (*'How well do climate and carbon-cycle models perform: benchmarking the CMIP5 palaeoclimate simulations?'*) in which initial results from these two projects will be presented at the Congress.

### **Activities of the Commission's IFG's**

The Commission recognizes IFGs as tackling broad themes within Quaternary science and therefore as providing a framework and focus for more specific individual projects. The Commission currently recognizes two IFGs: INTIMATE and ACER. The INTIMATE IFG (INQUA 0909) developed from the North Atlantic INTIMATE project, which was a PALCOMM project during the 2003-2007 inter-congress period, with the remit of engaging communities from other regions in the synthesis of ice-core, terrestrial and marine records and the development of a time-stratigraphic framework of climate and environmental changes over the past 60 ka. The ACER IFG (INQUA 1004) developed from the QUEST (Quantifying and Understanding the Earth System, a directed research programme of the UK Natural Environment Research Council, <http://quest.bris.ac.uk/>) Working Group on Abrupt Climate Changes, with the remit of examining the impact of abrupt climate changes during the glacial in the marine and terrestrial realm and explaining these changes through the use of data analysis and modeling.

### **INTIMATE IFG**

Leader: Chris Turney (Exeter, UK) from 2008 to 2010, then replaced by Sune Rasmussen (Copenhagen, Denmark)

Goal: to synthesize high-resolution ice, terrestrial and marine records spanning the period 60 ka to 8 ka to understand the impact and mechanisms of rapid and extreme climate change, thereby reducing the uncertainty of future predictions. This involves the improvement of age modeling to provide a more secure basis for correlations between different records, documentation of direction and rates of changes and the spatial domain over which these changes are recorded, and the development of environmental and quantitative palaeoclimate reconstructions.

Outputs:

- Publication of a revised timescale and event stratigraphic protocol for the Late Termination (Quaternary Science Reviews, 2008)
- Finalization of a special issue of Quaternary Science Reviews, with papers based on the 2008 INTIMATE Workshop (in press)

- Contributions to the formal definition and dating of the GSSP (Global Stratotype Section and Point) for the base of the Holocene (published in *Journal of Quaternary Science*, 2009)
- The major focus for the INTIMATE IFG recently has been in securing external funding to facilitate collaborative research activities. This has been achieved through a successful European COST (*European Cooperation in the field of Scientific and Technical Research*) action, originally led by Chris Turney and now by Sune Rasmussen). INQUA support has been crucial in leveraging €400,000 from the EU to fund workshops and meetings, with a primary focus on the North Atlantic region, over the next 4 years. The kick-off meeting of the COST action was held in May 2010, and this established working groups focusing on: (a) Dating and Chronological Modelling, (b) Quantification of Past Climate, (c) Modelling Mechanisms of Past Change, and (d) Climate Impacts.
- The INTIMATE IFG is holding two meetings within the framework of the COST action in 2011, one on “High-Precision Chronologies” (Potsdam, Germany, February 2011) and one on modeling (boreal autumn 2011)
- The INTIMATE IFG will be sponsoring a session at the INQUA Congress in Bern in 2011: ‘*INTEGRating Ice core, MARine and TERrestrial (INTIMATE) Global Records (60,000-8000 years ago): An International Focus Group*’, Conveners Dr. S. Blockley (U.K.) and Dr. W. Hoek (The Netherlands)

From a PALCOMM perspective, the INTIMATE IFG is intended to foster development of regional synthesis activities. The Australian-INTIMATE project (0806) is the first of these regional synthesis activities (see report below) and there has been considerable exchange between this project and the parent IFG. There is further scope for an expansion of the IFG activities in e.g. South America and Asia. Furthermore, with the expansion of the temporal focus of the INTIMATE IFG, closer integration with the PASH2 project is envisaged.

### **Abrupt Climate changes and Environmental Responses (ACER) IFG**

Leader: Maria Fernanda Sanchez Goni (Bordeaux, France)

Goal: to understand the timing, frequency and amplitude of ~~the~~ rapid climate variability during the last glacial period and the feedback mechanisms involved. This aim is to be achieved through:

- construction of a suite of global maps of vegetation changes through multiple Dansgaard-Oeschger cycles by applying biomisation techniques. This global synthesis will enable examination of broad-scale patterns of changes in vegetation cover and composition in response to the millennial-scale variability of the last glacial period and provide new insights into regional short-term variability of vegetation and climate,
- compilation of marine data to create maps of sea surface temperature changes through multiple D-O cycles, for comparison with reconstructions based on terrestrial data
- use of both of these compilations in conjunction with global models simulating vegetation-climate interactions to investigate the mechanisms underpinning D-O variability.

Justification: These analyses will provide:

- an understanding of abrupt CO<sub>2</sub> and CH<sub>4</sub> changes recorded in ice-core records,
- a firm basis for understanding how future climate change will impact on terrestrial and marine environments,
- insights into the influence of the biosphere over abrupt climate changes.

## Outputs:

- During its initial phase, the ACER IFG completed the regional syntheses and analysis of pollen and charcoal data begun in the framework of the QUEST-DESIRE project (NERC) (<http://researchpages.net/QUESTD-O/>). These regional syntheses were published in a recent issue of *Quaternary Science Reviews* (October 2010) “*Vegetation response to millennial-scale variability during the Last Glacial*”.
- Through a workshop in September 2010, the ACER group has created a data base of high-resolution pollen records covering part or all of the last glacial period. The database contains ca 100 individual pollen records and associated metadata.
- At this workshop, members of the group have developed a new version of the biomisation technique which generates robust quantitative reconstructions of the changing abundance of plant functional types through time, as well as detailed reconstructions of vegetation changes and associated measures of their uncertainties. Publication of these results is planned for 2011. This work represents a significant improvement in our ability to reconstruct past vegetation changes and application of the technique is likely to bring benefits beyond ACER’s current remit.
- Results of the ACER project were presented at the annual meeting of PMIP held in Kyoto in December 2010. ACER will also be sponsoring two sessions at the INQUA Congress in Bern in 2011: ‘*Abrupt climate changes: causes and processes*’ convened by Anders Carlson and Syee Weldeab (USA) and ‘*Abrupt climate changes: climate and biogeochemical consequences*’ Convened by Maria Fernanda Sanchez Goñi and Amaelle Landais (France)
- The ACER IFG’s second workshop is planned for autumn 2011 with the aim of stimulating comparison of the terrestrial and marine responses to abrupt climate changes during the last glacial period.

From a PALCOMM perspective, we envisage future ACER activities to include the creation of projects that tackle individual components of the proposed remit (e.g. synthesis of marine records, modelling of individual D-O events, etc.). Although the ACER IFG has a focus on rapid climate changes during the last glacial, there is also scope to expand the ACER approach for the study of abrupt climate changes at other times (e.g. during the Holocene).

## Activities of the Commission’s Projects

**0801: *Evaluation of PMIP Palaeoclimate Model Simulations***, Led by Sandy Harrison (originally Bristol, UK, now at Macquarie, Australia) and Pascale Braconnot (LSCE, France)

Justification: This project contributes to evaluation of climate models used for future climate change projections, specifically by encouraging the continental or global-scale syntheses of palaeoenvironmental data that are used as benchmark targets for palaeoclimate simulations being run in CMIP5. There are three Tier 2 (highly recommended) palaeoclimate simulations: the Last Glacial Maximum (21ka), the mid-Holocene (6ka), and the last millennium. After consultation with modellers in PMIP, this PALCOMM project has focused on filling critical data gaps.

## Outputs:

- A global data set of quantitative climate reconstructions for the mid-Holocene and Last Glacial Maximum (Bartlein et al., 2010). The data sets are available from the *World Data Centre for Palaeoclimatology* at NOAA NGDC;
- A global data set of vegetation reconstructions for the mid-Holocene and Last Glacial Maximum, based on an updated and standardized version of the BIOME6000 data sets (Prentice et al., in press). In response to demands by PMIP members, the data are being

reclassified to correspond to the different vegetation types simulated by each of the current vegetation-enabled climate models.

- A global data set of charcoal-based reconstructions of fire regimes through the past 150,000 years. This has been achieved through providing support for the work of the *Global Palaeofire Working Group* (GPWG). The latest version of this database (V2.5: Mooney et al., 2010) contains ca 800 records. In addition to global analyses of the data (Power et al., 2008; Marlon et al., 2008; Daniau et al., subm.), there have been regional analyses for North America (Marlon et al., 2009), Europe (Vanniere et al., in press) and Australasia (Mooney et al., 2010).
- A new initiative to create a multi-proxy data base for Australasia has been created (lead by John Dodson, ANSTO, Australia), in response to demands for better coverage of the southern hemisphere.

The project will be co-sponsoring a symposium at the INQUA Congress in Bern: '*How well do climate and carbon-cycle models perform: benchmarking the CMIP5 palaeoclimate simulations*' to be convened by Sandy P. Harrison (Australia), Pascale Braconnot (France), Ayako Abe-Ouchi (Japan) and Axel Timmermann (USA).

**0802: DIRTMAP2 Working Group**, Led by Barbara Maher (Lancaster, UK), Diego Gaiero (Cordoba, Argentina) and Natalie Mahowald (Cornell, USA)

Goal: to quantify the role of dust in the climate system, including through its mediation of terrestrial and marine biogeochemical cycles. This goal will be achieved by:

- Providing opportunities through workshops and other means for increased interaction between observationalists and dust-cycle modellers, and between the palaeo-community and those working on the dust cycle under current conditions, in order to improve our fundamental understanding of the role of dust in the climate system;
- Improving the resources available for 'benchmarking' dust-cycle model simulations of both modern and palaeo-conditions by producing an updated version of the DIRTMAP database ('DIRTMAP2');
- Improving the simulation of dust emissions through a better understanding of the geomorphic and sedimentological controls on emissions, and specifically through production of a global map of source-area characteristics which could be used as a basis for devising a new model parameterisation of preferential dust sources;
- Addressing, through carefully designed experiments, the impact of changing dust loads on radiative forcing during the Late Quaternary;
- Addressing the issue of iron bioavailability in dust, and iron fertilisation of high nutrient, low chlorophyll ocean sectors in order to quantify the magnitude of dust feedback through biogeochemical cycles.

Outputs: The DIRTMAP2 Working Group has capitalized on its success in bringing together this very diverse range of specialties in the area of dust and climate change - spanning modelling, present day observation and remote sensing, palaeo-dust records and biogeochemistry - and has generated a number of notable outputs, including:

- a review of the current state of knowledge on the impact of dust characteristics on radiative forcing and identifying potential for improvement of the parameterisation of dust properties in a modeling context (Durant A., J., Harrison, S.P., Watson, I.M. Balkanski, Y., 2009. Sensitivity of direct radiative forcing by mineral dust to particle characteristics. *Progress in Physical Geography* 33: 80-102)
- a review of the current state of knowledge on the relationships between climate, dust and ocean

biogeochemistry (Maher, B.A.; Prospero, J.M.; Mackie, D.; Gaiero, D.; Hesse, P.P.; Balkanski, Y., 2010. Global connections between aeolian dust, climate and ocean biogeochemistry at the present day and at the last glacial maximum. *Earth-Science Reviews* 99, 61-97) which was recognized as one of the top 25 articles published in Earth Science Reviews in 2010.

- an updated version of the DIRTMAP dust flux database (DIRTMAP3); the data are held in an Access database (Dirtmap-DataV3.mdb) accessible through the front end program in (DirtmapProgV3.mdb). The database is publically accessible and available from: [http://www.lec.lancs.ac.uk/research/LU\\_themes/inqua\\_working\\_group.php](http://www.lec.lancs.ac.uk/research/LU_themes/inqua_working_group.php).
- a prototype of a new scheme for prescribing preferential dust sources in a modeling framework. This work was led by Jo Bullard (Loughborough, UK). A paper describing this scheme has been recently submitted to *Journal of Geophysical Research – Earth Surface*.

The project will be sponsoring the symposium ‘*Mineral Dust: a product and agent of Quaternary climate change*’ at the INQUA Congress in Bern, to be convened by Paul Vallelonga (Denmark), Malin Kylander (Sweden) and Gisela Winckler (USA).

**0803: *Meltwater routing and Ocean-Cryosphere-Atmosphere response***, led by Lev Tarasov (Memorial, Canada)

Goals: to establish a constrained regional meltwater and iceberg discharge chronology for the northern hemisphere during the last deglaciation, and through this to provide a better understanding of the impact of freshwater discharge on global and regional climates. MOCA is working towards this goal through (a) holding workshops involving members of the glaciological and marine research communities, (b) liaising with the PMIP group to assist in the development of a modeling protocol enabling the input of ice sheet and freshwater flux data sets, and (c) through publications.

Outputs:

- DATED database – this database contains details of ice-marginal positions (and chronology) for the European ice sheet, and is undergoing final checking before publication and release;
- Generation of revised deglacial ice and meltwater chronologies for North America and northern Eurasia. Papers describing these revised chronologies will be submitted for publication in 2011;
- Significant contribution to definition of the ice sheets used in the current round of PMIP LGM experiments, and to the ice sheet and freshwater inputs for PMIP deglaciation experiments;
- A data-calibrated model of ice streaming in the Laurentide ice sheet has been produced, evaluated and published (Stoke and Tarasov, 2010)

The project will be sponsoring the symposium ‘*Understanding last glacial cycle ice sheets and meltwater impact through data and modeling*’ at the INQUA Congress in Bern, to be convened Lev Tarasov (Canada), Richard Gyllencreutz (Norway), Hans Renssen (The Netherlands) and Timothy Fisher (USA).

**0804: *Ombrotrophic peatlands as Holocene paleoenvironmental archives: towards a global network***. Led by Steve Jackson (Wyoming, USA) and Dan Charman (Exeter, UK)

Goal: to develop an international network of peatland records of palaeoclimate and carbon dynamics, and apply those records in a coordinated fashion to topical questions in earth systems science. This goal will be achieved through (a) community-building workshops, with opportunities for publication (b) targeted workshops addressing specific issues and leading to joint-authored publications, (c) creation of data sets and databases, and (d) liaison with the modeling community,

most particularly through working with the INQUA-sponsored PCMIP project.

Outputs:

- Special issue of the open-access journal “Mires and Peats” which gives detailed protocols for a all aspects of peatland studies, from coring through developing age models to interpretation of individual proxies. This special issue will be a “gold standard” for scientists beginning peat studies and will also ensure improved comparability between records;
- Special issues of the PAGES Newsletter, highlighting key aspects of the studies being carried out by the working group, and including 13 short papers;
- Reconstruction of changes in carbon accumulation in northern peatlands during the last millennium. This reconstruction, which will be published in *Nature* in 2011, illustrates how peat records provide robust data on carbon cycle variations, and in particular draws attention to the large differences between accumulation rates in the Medieval Warm Period and the Little Ice Age, and how this provides a target for millennial prognostic carbon-cycle simulations;
- Progress towards a unified peat accumulation database, and a data base of peatland proxy records, through collaboration with the NEOTOMA group

The project will be sponsoring the symposium ‘*Integrating peatland data for past climate and carbon cycle dynamics*’ at the INQUA Congress in Bern, to be convened by Dan Charman (U.K.) and Steve Jackson (USA).

From a PALCOMM perspective, it is important to foster stronger links between this project and PCMIP. Hence discussions are under way to establish whether it is possible to create an overarching umbrella for carbon-cycle related activities through the creation on a new IFG on the Carbon Cycle.

**0805: *Land-Ocean correlation of long Quaternary records from the Southern Hemisphere on orbital and sub-orbital timescales (PASH2)***, led by Peter Kershaw (Melbourne, Australia) and Jan-Berend Stuut (NIOZ, The Netherlands)

Goals: To determine the present state of knowledge on the nature and location of land and ocean records covering a substantial part of the Quaternary and make a preliminary assessment of regional and temporal climate variability. To identify critical gaps or areas on uncertainty and encourage and facilitate development of research proposals to fill them, particularly through involvement of the IODP and the Continental Drilling Program.

Outputs:

- construction of a metadatabase of 236 terrestrial records, and marine records incorporating terrestrial signals, covering at least the last 30,000 years on and around the major landmasses of Australia, New Zealand, Africa and South America. The records are visualised on Google Earth (<http://users.monash.edu.au/~pkershaw/database.html>) and have been included in ‘SahulTime’ (<http://sahultime.monash.edu.au/pollenConv/>).
- convening a symposium of the Southern Connections Conference held in Bariloche, Argentina, February 2010, entitled ‘*Controversies in the Quaternary of the Southern Hemisphere*’. Selected papers based on contributions presented in the symposium are being published in a special issue of *Quaternary International*.

The project will be sponsoring the symposium ‘*Late Quaternary climate trends: expression and causation*’, at the INQUA Congress in Bern, focusing on particular features of long-term climate patterns in the southern hemisphere, and to be convened by Jan-Berend Stuut (The Netherlands) and

Sheri Fritz (USA). From a PALCOMM perspective, the valuable work undertaken by PASH2 should be integrated during the next inter-congress period with ongoing activities in the INTIMATE IFG and through a closer liaison with the Australasian INTIMATE project. Progress towards this goal was achieved at Bariloche where the two projects co-sponsored the symposium.

**0806: AUSTRALASIAN-INTIMATE Phase II**, Led by Peter Almond (Lincoln, NZ) and Jessica Reeves (RMIT, Aus) and Tim Cohen (Wollongong, Aus) and Drew Lorrie (NIWA, NZ) with Marcus Vandergoes (GNS, NZ)

Goal: to develop an event stratigraphy for the Australia and New Zealand covering the past ca 60ka. A series of workshops have been held in Australia and New Zealand with independent steering but close collaboration between the two groups. The Australian leg of the project has used INQUA funding to leverage support from the *Australian Institute for Nuclear Science and Engineering* (AINSE) for meetings. The project is still involved in producing a climate stratigraphic synthesis and scheme for Australia while the New Zealand leg of the project is focusing on metadata compilation and regional climate reconstruction.

Outputs:

- An article describing the goals of the project has been published in *Quaternary Australasia* as part of the outreach activities
- An interactive database of paleoclimate information is currently being trialed based on data from New Zealand. This will allow users to access and compile metadata and undertake regional climate comparisons. It will be hosted at [paleoclimate.org.nz](http://paleoclimate.org.nz)
- A preliminary stratigraphy has been outlined and is currently being refined.

The project will be sponsoring the symposium '*Linking Southern Hemisphere multiproxy records and past circulation patterns: AUS-INTIMATE and wider Southern Connections*' at the INQUA Congress in Bern, to be convened by Tim Cohen (Australia) and Andrew Lorrey (New Zealand).

**0905: The Palaeo-Carbon Modelling Intercomparison Project (PCMIP)**, led by Ayako Abe-Ouchi (Tokyo, Japan)

Goal: to quantify the carbon-cycle feedback through using palaeoclimate records as a constraint on carbon-cycle simulations. This goal will be achieved through:

- coordination, analysis and inter-comparison of three experiments to diagnose aspects of the palaeocarbon cycle;
- promotion of data syntheses relevant to the carbon cycle, and use of these data to diagnose and evaluate the planned simulations;
- provision of an international forum for discussion of issues related to climate-carbon cycle feedbacks on palaeo-timescales.

Outputs:

- PCMIP has defined protocols for three palaeoclimate-carbon simulations. The millennium diagnostic simulation will use the Medieval Warm Period/Little Ice Age transition as a constraint of carbon-climate sensitivity, the millennium prognostic simulation will lead to improved understanding of the controls on atmospheric CO<sub>2</sub> concentrations on decadal to centennial timescales, and the LGM diagnostic simulation will evaluate the relative importance of different mechanisms in producing the observed drawdown of CO<sub>2</sub> under glacial conditions.

- Interactions with the relevant data communities are already encouraging the development of benchmark data-sets for prescribed model evaluation, most particularly peat accumulation on glacial-interglacial and millennial timescales (through collaboration with INQUA Project 0804) and on changes in fire regimes (through collaboration with the IGBP Global Palaeofire Working Group)
- PCMIP activities were reported and discussed at the PMIP meeting in Kyoto in December 2010.

The project is co-sponsoring the symposium '*How well do climate and carbon-cycle models perform: benchmarking the CMIP5 palaeoclimate simulations*', at the INQUA Congress in Bern. To be convened by Sandy P. Harrison (Australia), Pascale Braconnot (France), Ayako Abe-Ouchi (Japan) and Axel Timmermann (USA).

PCMIP has not held any project-specific meetings during 2010, largely because the project leadership has been heavily involved in defining experimental protocols within the framework of CMIP5 and in the definition of potential contributions of ongoing work on the palaeo-carbon cycle to the next *IPCC Assessment Report*. However, it will move into a more pro-active phase during 2011.

From a PALCOMM perspective, there is real potential in using PCMIP as a vehicle for the formation of an IFG on the palaeo-carbon cycle. There is a need for more focused data synthesis activities in this area (e.g. changes in permafrost extent, marine productivity, fire emissions) which would form the basis for individual projects within the IFG. Discussions are already underway about the development of an IFG and related project proposals.

### **Grants Awarded Under Commission Sponsorship, 2007-2011**

Commission projects all share a focus on documenting past climate and environmental changes and elucidating the underlying mechanisms. All of the projects are interdisciplinary, and involve a high proportion of early career scientists. Several projects have been working towards the goal of increasing the prominence of early-career scientists in leadership roles. The projects reinforce PALCOMM involvement with other international bodies, including the International Geosphere-Biosphere Programme (specifically through liaison and co-sponsorship of project workshops by PAGES) and the World Climate Research Programme (specifically through liaison with PMIP and PCMIP).

Since 2007, ten projects/IFGs proposed through and supported by PALCOMM have been funded (see table below). Two of these are co-sponsored by TERPRO (0803, 0804) and one is co-sponsored by SACCOMM (0909). The total amount of funding awarded to PALCOMM projects during the 2007-11 inter-congress period was **€74,945**.

<b>Project</b>	<b>Title</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>0801</b>	Evaluation of PMIP Palaeoclimate Model Simulations	4700	4700	5000	0
<b>0802</b>	DIRTMAP2 Working Group	4000	4000	4000	4000
<b>0803</b>	Meltwater routing and Ocean-Cryosphere-Atmosphere Response (MOCA)	3000	4000	0	4000
<b>0804</b>	Ombrotrophic peatlands as Holocene palaeoenvironmental archives: towards a global network	0	3000	5000	0
<b>0805</b>	Land-ocean correlation of long Quaternary records from the Southern Hemisphere (PASH2)	0	0	0	0
<b>0806</b>	Australasian INTIMATE Phase II	0	3000	3000	0
<b>0909</b>	INTIMATE: INTEgrating Ice core, MARine and TERrestrial records (60,000 to 8000 years ago) IFG	--	4800	0	0
<b>0905</b>	PCMIP (Palaeo carbon modelling intercomparison project)	--	0	3000	0
<b>1004</b>	Abrupt Climate changes and Environmental Responses (ACER) IFG	--	--	4000	4000
<b>1102</b>	Varves Working Group	--	--	--	3745

**Table 2: Amounts of INQUA funds allocated to PALCOMM projects during the 2007-11 inter-congress period.**

### **Preparations for the next Inter-Congress Period**

The process of soliciting nominations for inter-congress Commission officers has been initiated. The primary aim is to ensure representation of different sub-disciplines within palaeoclimatology and a reasonable geographical spread to ensure better liaison with different geographical communities. The future remit and key goals of PALCOMM will be discussed at the PALCOMM business meeting in Bern, and input from the wider commission membership via the PALCOMM web site for reasoned recommendations will be solicited via the commission website.