

PAGES SSC MEETING
25-27 July 2007—Atherton, Australia
MINUTES

PRESENT SSC

Rick Battarbee, Julie Brigham-Grette (Chair), Pierre Francus, Peter Kershaw, João Morais (IGBP), Takeshi Nakatsuka, Bette Otto-Bliesner, Frank Sirocko, Mohammed Umer, Ricardo Villalba, Pinxian Wang (Vice-Chair), Cathy Whitlock

PRESENT IPO

Louise Cromer (Science Officer), Thorsten Kiefer (Executive Director), Leah Witton (Project Officer)

ABSENT

José Carriquiry, Jérôme Chappellaz, Eystein Jansen, Heinz Wanner (Swiss Director)

GUESTS 26-27 JULY

John Dearing (Focus 4; plane delayed, joined after lunch 26 July), Kathy Hibbard (AIMES; stepped out during SSC membership discussion).

GUESTS 27 JULY

Isabel Cacho, Zhongli Ding, Hubertus Fischer, John Lowe, Ross Powell, Denis-Didier Rousseau, Jim Teller, Chronis Tzedakis, Chris Turney, Eric Wolff, Liping Zhou (plane delayed, joined later)

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1. Introduction & Miscellaneous

Julie welcomed everyone to the meeting and introduced each of the SSC members.

1.1 Approval of Minutes from Past Meetings

Julie called for comment on the SSC Minutes for the SSC and EXCOM meetings in Mendoza (2006). There were no amendments.

Decision The minutes from past meetings were approved.

1.2 IPO Staff

Louise introduced herself and her research. Thorsten reviewed staff changes and went over the roles of each of the PAGES staff.

1.3 Visiting Scientist Program

Thorsten described the facilities available at the PAGES IPO, and reported on visits to the IPO in the last year and visits planned for the future. Julie gave an overview of her visit in May, highlighting her meeting with Paul Burkhard at Swiss NSF, and encouraged all SSC members to visit the office at some time. Thorsten invited comments and suggestions on the program at any time.

2. Finances

2.1 Funding Overview

Thorsten reiterated that all NSF funding issues had been resolved and money secured. He also reviewed the extra funds available in the current grant for the OSM (2008/2009) and Summer School (2009/2010). The next NSF proposal will need to be prepared in mid-2009.

2.2 Budget 2007/2008

Thorsten gave an overview of next year's budget, going over each of the items, including running costs of the IPO, budgeted science activities, open calls, and publications costs. He commented that the budgeted amount for newsletter costs would probably go down because of the recent large reduction in hardcopy subscriptions.

Decision The budget for 2007/2008 was approved.

Discussion:

Ricardo: What about printing in India?

Thorsten: No saving on time. Cost saving was not big enough to continue.

João: Remove science coordination activities (SSC/EXCOM meetings and office travel) from the science budget and list under a separate heading.

Mohammed: What is the status of the PAGES Speaker Series?

Thorsten: Not fully organized yet. Cathy will give the first lecture as part of a previously funded workshop proposal ("Methods in Paleoecology"; 5-8 Oct. 2007, Chile).

Rick: Need to list Speaker Series as a separate budget item next year, not under workshop proposals.

Peter: Alternative to Speaker Series could be the funding requirement that a PAGES person gives a talk at PAGES-funded workshops.

Cathy: What is the difference between additional workshops and open call.

Rick: Used to be more of a mixed bag but it was decided at a previous meeting to distinguish between PAGES meetings and open calls for outside activities. PAGES-initiated activities should in essence be given priority.

Pinxian: Yes but do not forget the importance of PAGES funding for outside activities. Even small amounts of money help the community by showing PAGES support and helping workshop organizers secure other funding.

3. PAGES Products

3.1 Website

Thorsten summarized the website statistics and pointed out the most popular webpages and products. The calendar is still the most visited page but the jobs database is now almost as popular after Christian updated the software and the new design was publicized on listservers. Rick asked if it was possible to obtain a breakdown of statistics by country. Thorsten answered that it was not. Julie remarked on the impressiveness that the LOTRED meeting documents (2006) were still very popular. Ricardo replied that the meeting had been very successful and that other meetings were coming up as a result of it.

3.1.1 PAGES Information

Thorsten mentioned that PAGES science and activities needed updating on the website. An explanation of “what is paleoscience” will also be included. Julie added that it was especially important to make clear what PAGES does for paleoscience. Louise explained the idea behind the proposed Info Sheets (CCT4) and passed an example around. Julie reiterated that the idea was to provide the big picture, e.g., explaining to people the difference between regional versus global change.

Discussion:

Frank: Ask people what they want to know. From my experience of talking to schools, this would be particularly useful for teachers.

Peter: Provide answers to skeptics.

Leah: www.realclimate.org are already doing this.

Rick: Could we piggyback on their website?

Thorsten: IPO could contact them to ask about linking.

Cathy: U.S. National Committee for INQUA and AMQUA are developing a website on teaching climate change, supported by NSF. PAGES site would be a good link for that.

Bette: Background information on paleoscience would be helpful to give out to directors and managers.

Pierre: Need to focus on a specific audience.

Leah: The target level is end of high school, start of university, and teachers.

Julie: We could then work on translating the Info Sheets into different languages.

João: There are resources from IGBP National Committees to do this.

Pinxian: It is important to connect the information to original research.

Louise: The Info Sheets will contain links to additional information, pictures, etc.

Ricardo: Coordinate with IPCC reports. They have frequently asked questions.

Bette: They also have a paleoscience glossary.

Action IPO to update PAGES science and activities on the website.

Action IPO to contact SSC members for help in writing the Info Sheets.

3.1.2 PAGES Product Database

Thorsten asked for feedback on the usefulness of PAGES downloadable PowerPoints. Several people replied that they used them for teaching. Ricardo commented that they needed updating. Julie responded that this would require SSC input. Thorsten reported that Louise would be adding to the paired pictures and might contact SSC members individually to seed a new photo database.

Action IPO to contact SSC members for photos for the Product Database.

3.1.3 PAGES People Database

Thorsten went over the subscriber statistics, explaining that the database was updated regularly and that the numbers were therefore reliable. He highlighted the Argentinean involvement since the LOTRED meeting in 2006, noting that people subscribe once PAGES makes its presence known in a country.

3.1.4 National PAGES

Not discussed.

3.1.5 Other Website Items

Not discussed.

3.2 Newsletters

Thorsten remarked that people were losing the motivation to subscribe to PAGES. Unless they wanted to get a hardcopy of PAGES newsletter, they could simply download the digital version without joining. He proposed the idea to provide *PAGES News* in the format used by *Science* or using Zinio (a more user-friendly online/offline reader than Acrobat). Both these options would require subscription. There was a discussion on Zinio and it was agreed that the office would look into it.

Action **IPO to look into the use of Zinio for PAGES digital newsletter.**

[Note: The IPO has since discovered that the Zinio format is not suitable, since the company only has expensive contracts with large publishers.]

A discussion then followed on the cost savings that had resulted from the reduction in hardcopies. Thorsten reported that the biggest saving was on postage. He reminded SSC that PAGES would never change over to a completely digital newsletter, since hardcopies were essential for developing country scientists, for use in promoting PAGES at meetings, and in establishing a presence with the paleocommunity and policy makers.

Discussion:

Ricardo: In some areas in South America, the PAGES newsletter is the best you can get in paleoscience.

It provides information and connections to people.

Bette: It would be good for university libraries to add *PAGES News* to their list of electronic journals.

Pierre: Consortiums of libraries exist.

Thorsten: We could start with EGU for a list of libraries.

Frank: Offer libraries a block contract for all the issues. They would need hardcopies as well.

Leah: That would be too expensive for PAGES.

Ricardo: People who wish their library to carry the hardcopies could contact the IPO.

Action **IPO to target libraries to add PAGES newsletter to their list of electronic journals.**

Thorsten provided an update on the issues planned for 2007 (southern hemisphere paleoscience and paleoceanography) and on suggestions for future issues. Speleothems and data-model comparisons might be the first two issues for 2008, with a third issue on IPY. Beyond that, interest exists for a synthesis newsletter on long records from large lakes and on global monsoon. Pinxian agreed that the lake synthesis could be incorporated into the monsoon issue. This topic could move to 2009 or later.

Discussion on other suggestions for future topics:

Peter: Quantification of paleoclimate—new proxies, better estimates.

Cathy: Fire issue, tree rings, historical, human.

João: Do not forget PAGES input on IGBP 2008 Congress sessions. There could be a section on PAGES and existing African initiatives on paleoscience.

Thorsten: Single articles could go in the open section but flagged as IGBP congress articles.

Cathy: Careers in paleoscience. *Science* has done this. It is important that people realize there is a future in paleoscience.

Bette: Include younger scientists too, interdisciplinary aspects.

Frank: People are being lost to the applied sciences because they feel that paleoscience will not be able to offer them future employment. The key to getting bright people is to convince them that you can get a job and that the techniques you learn while studying paleoscience can be applied to other areas (e.g. insurance).

Louise: Look at the expertise that people have and the broad base that they came from to get into paleoscience, e.g. zoology, physics, and vice versa.

Rick: Could have a special feature on careers in each newsletter instead of a special issue.

(See also comments on timing of a special issue on careers in 4.5 - PAGES 3rd OSM, below.)

3.3 Special Issues

Not discussed.

3.4 Synthesis Papers in prep.

Not discussed.

3.5 Posters and Flyers

Not discussed.

4. Funded Workshops and Initiatives

4.1 2006 Funded Workshops and Initiatives

Thorsten called attention to the list of workshops that had taken place and pointed out that products arising from the workshops had also been included. He explained that a workshop report for the PAGES newsletter was now mandatory. Rick pointed out that the synthesis book for the HOLIVAR meeting should also be added. Ricardo mentioned that the LOTRED special issue would be published in *Paleo3*.

4.2 2007 Funded Workshops and Initiatives

As above.

4.3 Pending Workshop Proposals

(26 July) Julie outlined EXCOM's decision to allocate \$12,000 to the current call and not to announce an open call before the Fall AGU, in order to save money for PAGES Foci and CCT activities (e.g., first Focus 4 PHAROS steering group meeting), and for the SSC meeting/IGBP Congress in South Africa.

4.4 Discussion on PAGES Workshop Funding

How is PAGES workshop support perceived in the scientific community?

Pierre: What is the success rate for funding?

Thorsten: Quite high but usually not as much as is requested (since PAGES tends not to fund over \$5,000 for open calls).

Bette: How do NSF Program Managers look at this sort of money?

Julie: In general, they feel that spreading out the funding in this way is good.

Thorsten: Some reviewers of the old grant were sensitive about the impression that PAGES was redistributing funding. Therefore, it is important to stress that PAGES gives workshop support (which goes beyond money only), not just funding.

Pierre: PAGES should not be seen to be giving money to friends. I have encountered people who are of this opinion.

Leah: Refer these people to the PAGES website where there is a public list of workshops funded each year (www.pages-igbp.org/services/wsfunding/). There it is clear that this is not the case.

Would “science” money be more efficiently spent on activities initiated by PAGES Foci & CCT?
Should funding be split between open calls and PAGES activities?

Louise: Workshop funding must be furthering PAGES goals.

Leah: Need to be sure there is enough money for PAGES Foci and CCT activities.

Bette/Rick/Ricardo/Frank: \$40,000 is too much for open calls in comparison to the amount for initiatives.

Cathy: Support some open workshops that are closely aligned to PAGES goals. We do not necessarily need to redistribute the money.

Julie: Put this topic on hold until after the discussion of the Science Plan, and the day with guests, when it is possible that new activities are suggested.

Does the involvement of SSC members as liaisons serve its purpose?

Louise: Liaison for the workshops should now be through Foci leaders rather than SSC members. It should be a requirement that workshop organizers have contacted the appropriate Foci leader before submitting an application.

Should workshop organizers be required to sign a contract with PAGES?

Should a percentage of larger workshop funding be withheld?

Leah outlined the financial reporting required for workshops and the difficulties the IPO had encountered in the past with workshop organizers. Thorsten explained that the IPO would set up a contract stipulating the requirements of support for workshop organizers to sign before the funds were released.

Rick: Make the rule that grants over \$5,000 will have a portion withheld until the organizer has provided the required documents. The IPO can still be flexible on specific cases.

**Action IPO to prepare a contract for workshop organizers receiving PAGES funding.
Decision IPO to have the option to withhold a portion of PAGES workshop funding for grants over \$5000.**

4.5 Upcoming Meetings

AGU Fall Meeting/EGU Assembly

Thorsten reminded the SSC that sessions were required for EGU and AGU.

IGBP Congress

João went over the list of topics for the 2008 Congress.

PAGES 3rd OSM

Julie noted that the location of PAGES 3rd OSM, to be held in the western USA, still needed to be decided. A Program Committee would also need to be appointed and SSC should start thinking about possible big themes that address the Science Plan. She said that, unfortunately, it would not work to piggyback the OSM with AIMES, as they will hold their meeting in the UK in 2010. Thorsten proposed that there be an AIMES session at PAGES OSM and vice versa. Rick said that it was important not to clash with other meetings, e.g., the 2009 International Paleolimnology Association meeting would be held in Mexico in the 3rd or 4th week of June. Thorsten commented that the timing of the OSM would be good for putting together a new NSF proposal. He also mentioned that a Young Scientists’ meeting before the OSM, similar to the ESSP meeting, was being considered. He felt that the ESSP meeting had been very international, with very good people, in an attractive framework. João commented that there would also be a young scientists’ session at the IGBP Congress. Leah remarked that this meeting would be very good timing for a PAGES newsletter special issue on careers in paleoscience. Ricardo

suggested exploring whether the OSM could be joined with the IAI annual meeting (contact Brian Luckman).

Paleoscience Summer School

Thorsten mentioned the joint PAGES-NCCR Summer School in 2009 with a paleoscience focus.

5. Reports on Research and Activities

Not discussed.

6. SSC & EXCOM Membership

6.1 Current SSC Members

Julie listed the members rotating off at the end of the year (Rick Battarbee, Frank Sirocko, Pinxian Wang). Heinz Wanner's second term as Swiss Director was then discussed.

Decision **Heinz Wanner was unanimously approved for a second term.**

6.2 New EXCOM members

Julie explained that replacements for Pinxian and Rick would need to be finalized before the next EXCOM meeting in Dec., so that the new members could attend this meeting. A call for nominations would be announced by email after the SSC meeting. She also outlined the Swiss and U.S. NSF requirements for her replacement at the end of 2008, explaining that since there was a non-U.S. Executive Director, another U.S. member—Cathy or Bette—would need to be elected to Chair. Julie would discuss with Cathy and Bette separately about this. João asked that SSC nominations be finalized before the IGBP Officers meeting in Sep. 2008.

6.3 New SSC members

There was a lengthy discussion about the factors that are important in selecting new members: expertise versus nationality, new versus well-known people, the transparency of the process and how the elections are perceived by the community, the advantages and disadvantages to the SSC of handing down a position to a scientist already working within PAGES, international versus national connections, and the weight that should be given to countries with the most subscribers. The following ranking of factors was unanimously agreed upon: (1) coverage of PAGES Focus areas, (2) ability to take on leadership aspects of science, (3) expertise, and (4) geographical representation. To get a feeling for SSC opinion, members were asked to indicate their top 5 choices in a secret ballot.

Thorsten remarked that information on what the nominees wanted to do for PAGES was missing from the application requirements. This should be included in the future.

The timetable for replacing people was also discussed. Thorsten reported that PAGES SSC was not large in comparison to other projects and that the only limitation on having a larger SSC was cost. In his opinion, there was a need for more rather than less SSC members at this stage in PAGES science strategy. Julie suggested that costs might be kept down with a larger SSC if not all members attended each meeting. This was the case due to illness and other factors anyway.

(26 July) Julie reported on the outcome of the SSC voting. EXCOM recommended electing 4 new SSC members for 2008. Their recommendation of Dearing, Ding, Schulz and Wolff was based on the need to push forward with PAGES new Science Plan. They suggested possibly electing another two people for 2009.

- Decision** **John Dearing, Zhongli Ding, Eric Wolff and Michael Schulz were nominated to the SSC for 2008.**
- Action** **IPO to seek IGBP approval of PAGES nominated SSC members.**
[Note: The IGBP Officers have since approved the nominations.]

7. PAGES Science and Implementation Plan (SIP)

[Note: IGBP has requested that the “Science and Implementation Plan” (SIP) be referred to as the “Science Plan and Implementation Strategy” (SPIS) in order to place more emphasis on the science; the main focus of the document. PAGES will adopt this change in all future documents.]

7.1 Presentation and Discussion of SIP Draft Status

Thorsten and Julie went over the requirements for the SIP. The idea is for the SIP to be a 5- to 10-year document and for it to be an active document that evolves when PAGES moves in different directions. For this reason, names of Foci and CCT leaders will not be included. The SIP needs to be put on the PAGES website to get people excited about the science. Kathy pointed out that the SIP would also be very useful for taking to funding bodies.

Thorsten reviewed the introductory sections to the SIP. The first section on “why paleoscience?” is crucial in explaining the importance of this research, especially to non-paleoscientists. Thorsten presented 5 arguments as to why paleoscience is important:

1. What has happened can happen (abrupt climate change, ice sheet collapse, ocean overturning, ocean chemistry)
2. Long-term (natural) context for recent changes (last millennia climate, greenhouse gases)
3. Near-analog scenarios for the present and near future (Eemian, PETM)
 [Bette suggested also including the Pliocene]
4. Large range of different scenarios provide clues for Earth System understanding (ENSO variability, monsoon teleconnection, vegetation/ecology changes)
5. Paleo data provide scenarios for model validation (LGM, past interglacials, rapid transitions)
 [Bette suggested rephrasing this point towards something like “Quantitative process understanding from modeling paleo-scenarios” with validity across all four former points.]

The SSC agreed that these arguments should be included in the SIP, possibly bulleted and boxed.

Thorsten then suggested including an additional topic outlining the philosophy of this upcoming phase of PAGES: Overcoming boundaries by facilitating integration of science from different communities, such as between:

- spheres (hydro-, atmo-, cryo-, bio-, anthro-)
- local, national and regional
- data analysts and modelers
- modern process and paleoscience

The SSC agreed that these topics should be included early in the SIP.

Individual SSC members presented updates on the Foci and CCT, which were then discussed:

F1 - Past Climate Forcings

Bette presented an update on Focus 1 scientific targets and implementation planning, which are now being closely coordinated with Focus 2.

- The Focus 1 SIP chapter is very mature.
- The idea of a direct effect of geomagnetic field changes on climate via cosmic rays and cloud formation was discussed. It was concluded that this idea was very controversial and did not currently need to be included in the SIP as an additional forcing.
- PMIP2 will hold a meeting in Wisconsin, Madison, USA in Sep. 2008.

F2 - Regional Climates

Thorsten (in the absence of Focus Leaders Heinz Wanner and Eystein Jansen) gave a brief overview of the SIP chapter and the latest developments.

- New regional groups for the last 2k climate variability wish to become part of the Focus 2 network (Arctic – Nalan Koc; Patagonia-to-Antarctic Peninsula – Dominic Hodgson; Eastern Asia – Liping Zhou; Australasia – Chris Turney). Thorsten showed a PPT from Dominic Hodgson to illustrate the scope of the Patagonia-to-Antarctic Peninsula group (called CACHE-PEP).
- Focus 2 is currently heavily centered on the last 2k but is open to other timescales. This would depend on other scientists taking an active lead. A proposal for a PAGES Working Group (WG) on “Past Interglacials” could add a longer timescale component.

F3 - Land/Ocean/Cryosphere Dynamics and Linkages

Pinxian presented an updated overview of Focus 3 and the “Global Monsoon” WG.

- The Monsoon WG is well underway and a first planning discussion will be held alongside the Alexander von Humboldt Asian Monsoon Symposium in Beijing, China in Sep. 2007. Pinxian suggested holding a PAGES Global Monsoon symposium in 2008, to result in a special journal issue.
- Julie presented a PPT from Rainer Gersonde on the “BIPOMAC” WG, which has now started as an IPY project. The implementation section of this SIP chapter still needs a list of tasks to be addressed.
- Thorsten reported on the status of the “Past Ocean Biogeochemistry” WG chapter. Isabelle Cacho, paleoscientist on the SOLAS SSC, is composing a document on PAGES-SOLAS common themes, and the idea is to use this document in the SIP. It was agreed that ocean acidification should be one theme of the WG but that the WG should remain focused and not embrace too many topics.

F4 - Past Human-Climate-Environment Interactions (PHAROS)

John Dearing presented the goals and structure of Focus 4.

- The Focus has a strong European dominance but non-European scientists are now gradually joining.
- It was agreed that a description of IHOPE and the PAGES contribution to it should become incorporated into the Focus 4 SIP chapter.
- John expressed the desire to set up a website for Focus 4. It was agreed that the site should be hosted in Southampton (so that John could make the updates regularly) but that it should be easily recognizable as a PAGES site (with a similar appearance and structure to PAGES website).

CCT1 - Chronostratigraphy (TIMES)

Frank presented a table of advantages and disadvantages of common dating techniques in order to highlight the need for developing the data basis for an informed event stratigraphy.

- Frank suggested addressing the timing of individual stratigraphic events (or groups thereof) during regular sessions at AGU/EGU or elsewhere and feeding the results into a PAGES-TIMES (Terrestrial-Ice-Marine Event Stratigraphy) table on the PAGES website. Kathy commented that AGU accepted sessions with (process-oriented) scientific topics only.
- Bette was concerned that events were assumed to be globally synchronous and stressed the need for absolute dating and error bars. She also suggested that modelers be included in the meetings.
- Rick suggested including more recent methods as well (e.g., ²¹⁰Pb).
- Frank concluded by saying that this idea would also be proposed to INQUA INTIMATE.

CCT2 - Proxy development, validation, calibration

Ricardo gave a comprehensive presentation on this CCT and the content of the SIP chapter.

- So far, the SIP chapter is focused on issues of proxies used for annual-scale reconstructions of late-Holocene climate reconstruction. It requires openness towards longer timescale approaches.
- With the Proxy Data Uncertainties workshop in Trieste, Italy, in June 2008, a major activity in the scope of CCT2 is underway.

CCT3 - Data management

Thorsten presented the CCT and the central issue to incite data submission and support data access.

- Peter suggested people could be motivated to submit their data by only giving them access to data if they had submitted their own data to the database. Thorsten replied that the PAGES Databoard preferred to encourage submission rather than be restrictive.
- Pinxian called for the inclusion of some sort of flag to indicate to users that data might not be complete, since it takes many years to have complete and good datasets. João agreed that the data needed to pass some sort of quality control and that any problems with the data needed to be defined for the user. Bette responded that published data have gone through such quality control already.

CCT4 - Dissemination and Outreach

Julie highlighted new ideas for this CCT and encouraged the SSC to add suggestions for this topic while they were editing the SIP.

- Web-based infomercials (e.g., You-Tube, PowerPoints with voice over, podcast such as POLAR-PALOOZA), with 2 mins on each of the Foci areas. This might also include people and careers, using pictures and audio files. We could start with SSC members or use AGU to interview people.
- Leah reminded SSC of the possibility of PAGES applying for an NSF grant for Communicating Research to Public Audiences. It is a continuous call with no deadline.

General Discussion:

Thorsten: It is not necessary to follow the Focus 3 structure and have several Working Groups for each Focus.

Thorsten: PAGES science has an integrative structure and many activities fit into more than one Focus.

Rick: Include links to other Foci within the SIP text.

Ricardo: What other ways can PAGES help people besides workshops? E.g., facilitating lab collaborations or setting up a web interface to bring together data and modeling communities.

Bette: There is also the need to facilitate interactions after workshops, so that people do not just work intensively together and then disperse.

Pinxian: Promote modeling so that people understand what it is about and what is required.

Ricardo: Provide training for modelers.

Bette: Have a young scientists' program.

Julie: This would be a good topic if we have an OSM young scientists' meeting.

Kathy: Role of PAGES with INQUA needs to be discussed at the top level, not with leaders of individual projects.

Pinxian: Find a more specific place for IMAGES and PAGES/CLIVAR in the SIP.

7.3 IHOPE and AIMES Discussion Outline:

Kathy Hibbard presented both projects.

- Creating archives of data is an important component of IHOPE. Kathy explained that to dispel concerns about giving up control over data, the data archive would be organized as an integrated data system with no single point of political control (i.e., no dedicated server). Also, the PI would keep full control over data visibility. Data visualization is planned with Integrated Data Viewer (IDV) technology.
- An IHOPE OZ (Australia) workshop is planned for the latter half of 2008.
- AIMES will hold Young Scholar's Network workshops. In 2008, one on "Cultural uses of landscape fire, past, present, future" could be held jointly with PAGES and/or GLP at NCAR. In 2009, a workshop in Burgundy lead by Carole Crumley could also be held together with PAGES.
- João stressed the importance of having a coordinated worldview of PAGES and AIMES.

7.4 Next Steps:

SIP

Julie reiterated that the SSC should provide comments and corrections to the SIP by the end of Aug., even if it was just feedback on one section. The SIP should go to internal review (within PAGES and IGBP partner projects) this fall. PAGES can suggest reviewers but the ultimate decision will rest with IGBP. Internal review should take a couple of months. In early 2008, the SIP should go for external review (sent out by IGBP).

Action **SSC to read SIP chapters and send comments to Thorsten by 31 Aug. 2007.**

Action **SSC members to send their suggestions for SIP reviewers to Julie.**

Open Science Meeting

Julie: The Program Committee should be composed of Focus Leaders.

Pinxian: Encourage younger people to give talks.

Leah: Have an open abstract submission and select the talks from those submitted.

Kathy: Invite a few people and leave the rest open.

SSC meeting

The next SSC meeting will be held 5-6 May 2008 in Cape Town, as part of the IGBP Congress.

EXCOM meeting

The next EXCOM meeting will be held in San Francisco on Sunday, 9 Dec. 2007, the day before AGU.

IGBP Congress

João gave an update on the IGBP congress. The focus is on applied Earth System science, which is what the funding agencies, and local and regional sponsors welcome. The goal is to provide the direction for IGBP for the next 4-5 years. On day 5, the National Committees and Advisory Bodies will report back to the plenary before the panel and formal Congress closure. The sessions with PAGES contributions are as follows (first name in bracket is convener, italics indicate PAGES contributors):

- 1- Global change in the Arctic (Kathy Law, IGAC; *Julie*)
- 2- Methane in the Earth System (Torben Christensen, iLEAPS; *Jérôme; Eric Wolff*)
3. Fire in the landscape (Sandy Harrison, AIMES; *Cathy*)
4. Sea level change, ice sheet stability and vulnerable coastlines (Julie Brigham-Grette, PAGES)
5. Water cycle, water resources, floods and drought (Pavel Kabat iLEAPS; *Mohammed*)
6. Monsoon Systems (Céline Mari, IGAC/ Ailikun, MAIRS; *Zhongli Ding*)

João noted that the people listed first in the session proposals and/or the associated projects were usually the session conveners. He stressed that PAGES needed to put forward the scientific content that it wanted represented during these sessions as soon as possible.

Julie/Thorsten: We need to contact the people listed as conveners regarding PAGES input to other sessions. Session 22 (Interconnections between air pollution, climate change, energy and human impacts) – contact Denise Mauzerall (AIMES) about opening up the session to include Focus 4 talks.

Peter: What is the timescale for finalizing sessions?

João: The deadline to the IGBP secretariat for session speakers and abstracts is 11 Jan. 2008, with posting on the Congress website later that month.

8. Guest Discussions

Julie welcomed everybody and people introduced themselves. Julie then provided an overview of PAGES for the guests attending the meeting. Jim Teller and John Lowe asked whether PAGES had

considered being involved in the International Year of Planet Earth. Thorsten replied that PAGES had no specific plans as yet but was open to the idea.

8.1 PAGES-INQUA Links

Denis-Didier Rousseau gave an overview of INQUA history and its commissions. INQUA is now a union under ICSU. Countries that are part of the union provide the funding (in the order of €40,000-75,000 a year). Denis also explained that the nature of INQUA and PAGES are very different. While INQUA is a union that is intended to be a “permanent” institution, PAGES is a program that will end once its goals are achieved. In that respect, INQUA acts long term, while PAGES can move faster on new hot topics.

Jim Teller explained the INQUA structure and project organization of commissions, sub-commissions, and projects. He pointed out that INQUA does not fund research per se but brings people together. He also presented the objectives and projects that have been funded under TERPRO (Terrestrial Processes, Deposits, and History Commission). New focus areas are presently being identified and Jim pointed out that there is abundant thematic overlap and hence ample opportunities for cooperation between INQUA and PAGES.

John Lowe outlined the background, aims, membership and projects of PALCOMM (Paleoclimate Commission). He commented that organizations like PAGES and PMIP should help in identifying what INQUA should be spending its money on. The PALCOMM Advisory Council meets electronically to identify key areas in paleoclimate. They particularly aim to identify areas where more paleo data is needed and to help provide this missing data through large-scale projects. INQUA recommends data submission. PALCOMM seeks closer partnerships with the paleoceanographic community and between the modeling and data communities. Sandy Harrison will follow John as the new Commission President for the 2007-2011 inter-Congress period. Peter Kershaw is now Vice-President and Jamie Shulmeister secretary.

Eric: INQUA seems to be dominated by terrestrial scientists. Are you trying to link to the marine and modeling communities, or requesting their inclusion in INQUA?

John Lowe: Up until now, there has been limited direct involvement of paleoceanographers and modelers within INQUA’s formal activities, which tend to be dominated by terrestrial scientists. However, many INQUA terrestrial scientists are already fully engaged with important strategic national and global interdisciplinary research initiatives, and hence collaborate closely with the modeling and paleoceanography communities. There is probably much economy of effort and synergistic dividend to be gained by closer dialog between all three communities, as well as a sharper orchestration of their joint interests and activities. It should be noted that INQUA has and is attempting to break down real and perceived barriers. Nick Shackleton (a long time supporter and recent INQUA President) reorganized the structure of INQUA Commissions to make them more open and embracing. Within PALCOMM, at least 4 projects—Land-Ocean correlation in the Southern Hemisphere, INTIMATE, OZ-INTIMATE and Stage 11—encourage and have been successful in attracting the participation of segments of the marine community, while the election of Sandy Harrison will go a long way to increasing the involvement of the modeling community.

Summary of discussion:

PAGES and INQUA agreed to begin a dialog on organizing joint funding of initiatives and workshops of common interest. This would require a formal endorsement process for grant applications. It was suggested to have joint sessions at EGU on topics of interest to PAGES and INQUA (e.g., Dansgaard-Oeschger cycles, chronology—event stratigraphy and standardization). It was also proposed to develop an online generic database listing the various related programs (with an explanation of program acronyms, hierarchy and goals) in order to articulate the specifics of the numerous projects, programs and other organizations.

8.2 Past Interglacials WG

Chronis Tzedakis presented a proposal for a new PAGES Working Group “Past Interglacials” (PIGS). The working group builds on the former INQUA MIS 11 WG but will extend towards the suite of interglacials of the “EPICA timeframe”. Issues the WG will address with data and modeling deal with timing, climate response and patterns of variability, and the carbon cycle. Those present found the proposal to be very timely, sound and complementary to the Focus 2 groups on the last millennia. The WG proposal was approved by the SSC and a first workshop for overview and detailed planning was encouraged. Hubertus commented that the new German Science Foundation (DFG) focus program “INTERDYNAMIK” would contribute to the goals of PIGS, and announced that there was an ESF conference proposal by the EPICA community on “Stability of warm phases in the past and in the future”.

[Note: Since then, this conference proposal has been resubmitted and is currently under review.]

8.3 PAGES-SOLAS Links

Isabel Cacho (SOLAS SSC) summarized the aims and processes of interest to SOLAS (Surface Ocean–Lower Atmosphere Study), as well as the foci and activities overlapping with PAGES. Dust flux to the oceans, the nitrogen cycle, and iron and marine productivity are themes with potential commonality with both PAGES and IMAGES. Isabel remarked that IMAGES is perceived to be more of an expedition-oriented group rather than a scientific one. She also commented that SOLAS scientists needed help with the interpretation of paleoscience research. Particularly useful would be access to the conclusions and syntheses, rather than original data. PAGES has a responsibility to more effectively communicate and interact with them.

Julie: PAGES Info Sheets could be used in this way.

Kathy: There could be an integrative workshop on this at the IGBP Congress.

Isabel: Dialog between PAGES, IMAGES and SOLAS will take place. There will also be involvement via summer schools and open science meetings.

Thorsten: The next issue of *PAGES News* will have a section on paleoceanography. The newsletter needs to be distributed to SOLAS and IMBER.

Chronis: How is the relationship of PAGES and IMAGES?

Thorsten: It was largely detached but is now rapidly improving, e.g., through common workshops.

Julie: There are also growing connections between ICDP (International Continental Drilling Program) and IODP (International Oceanographic Drilling Program).

8.4 Past Atmospheric Dynamics

Denis presented an update on the Past Atmospheric Dynamics initiative. This initiative has evolved in focus since the first proposal to the SSC in Beijing in 2005 from being predominantly loess-based towards a broader scope based on reconstructions from eolian deposits, modeling and knowledge of present-day atmospheric dynamics and processes. A workshop is planned on northern mid-to-high latitudes for 2008, maybe in Heidelberg, Germany. This workshop needs to enter its concrete planning phase now. A complementary workshop on southern hemisphere mid-high latitudes will take place later. The INQUA meeting could be used to approach suitable southern hemisphere leaders. In 2007 and 2008, EGU sessions on the topic were/will be held. The organizers of and contributors to the series of conferences on the southern deserts may be the best people to approach here.

8.5 Focus 2 WG E Asia 2k

Liping Zhou introduced a plan to organize a group on paleoclimate of the last 2k in eastern Asia, as part of the Focus 2 network of regional groups. He gave an overview of existing paleoclimate data from various archives and discussed the motivation and challenges—dataset generation and comparison, chronology and proxy calibration, and comparison with model results. The SSC supported the idea to set up an East Asia 2k WG led by Liping.

Ricardo: The PAGES 2k network plays an important role in ensuring comparability of reconstructions between regions by making sure that the same protocols are followed in all groups.

8.6 Focus 2 WG Australasia 2k

Chris Turney presented the background for setting up a WG on paleoclimate of the last 2k in Australasia. He highlighted the PAGES/CLIVAR co-sponsored workshop on the topic that took place in Canberra in June 2005 and resulted in a *JQR* special issue. He presented a quality screening of the data, concluding that a reconstruction of decent quality and regional coverage would be possible for the last few centuries but that high-quality data density declines rapidly further back in time. The challenges of such a group are to expand sites across more of Australasia, integrate results with other regions in the southern hemisphere, extend records further back in time, develop moisture proxies, and model climate history. The SSC gave their support to the proposal for an Australasia 2k group led by Chris.

8.7 Monsoon WG

Zhongli presented an overview of aspects of paleo-monsoon evolution and variability that could be addressed by the Focus 3 Global Monsoon WG. Aspects include the initiation of monsoon systems, monsoonal variability on different timescales (tectonic, orbital, sub-orbital), and the impact of monsoon variability on ecosystems, societies and global change, in the past and in future projections.

John Lowe: The only way we are going to be able to identify causal links from paleoenvironmental data and develop predictive capability using paleodata is by paleodata-modeling experiments and their validation. INQUA would therefore be eager to contribute more strategically to the paleodata-modeling agenda, perhaps in collaboration with PAGES. INQUA's particular strength would be in galvanizing the terrestrial paleodata community and their collective datasets.

Bette: Models are indeed trying to simulate the monsoons but there is still a lot to do, especially in East Asia.

Liping: Is the effect of tectonics included in the models?

Bette: Not a lot has been done on this in a systematic way. We need to know if the models can really represent monsoon circulation. Different models have very different projections.

Julie: Tectonic questions are of less relevance to PAGES but may be more relevant to INQUA. PAGES has traditionally restricted its research to timescales of continental distribution similar to the present, although we remain open, such as with the PETM that has some relevance to PAGES questions.

Liping: If you consider the societal influence of monsoon, the need to know about monsoon initiation to improve prediction may make the older timescales relevant.

Pinxian: PAGES new project is to separate insolation changes into regional and local effects, and find common themes by knowing the difference between regions.

Thorsten: How far back does it make sense to go? A mono-polar ice sheet world (Pliocene scenario) seems relevant for teleconnections and global monsoon.

8.8 BIPOMAC WG

Discussed on previous day.

8.9 PAGES-Antarctic Climate Evolution Links

Ross Powell gave an overview of ACE (Antarctic Climate Evolution) and its role within SCAR. He highlighted how it could contribute data related to Antarctic ice volume changes and high-latitude ocean temperatures for linked GCM-ice sheet modeling. He saw close ties between ACE and PAGES new Foci 1, 2 and 3. He confirmed that ACE would be interested in holding joint sessions at international meetings (e.g., AGU, EGU, the International Geological Congress has an ACE-BIPOMAC session), in continuing reciprocal representation at SSC meetings, and in issuing joint scientific volumes on relevant topics.

8.10 PAGES-IPICS Links

Eric Wolff and Hubertus Fischer gave an update on the scientific and programmatic progress of EPICA, and particularly IPICS, and reiterated the relationship with PAGES, which will remain informal but symbiotic with respect to fostering scientific exchange and mixing of communities. The SSC indicated that it wanted to continue having the ice core community scientifically engaged in and interacting with PAGES.

[Note: Eric Wolff has since been approved as an SSC member starting in 2008.]

BREAKOUT GROUPS

SSC members and guests formed 4 topical breakout groups to inform each other about current activities, develop some of the ideas already discussed during the meeting, and come up with new concepts.

The breakout topics were: (leaders in brackets):

- 1) Interglacials (Chronis Tzedakis)
- 2) Past regional climate variability 2k (Ricardo Villalba)
- 3) Paleooceanography/ocean biogeochemistry (Isabel Cacho)
- 4) High- to mid-latitude processes (Ross Powell)

Report from Group 1: Activities on past interglacials

Tzedakis; Otto-Bliesner, Wolff

Science Programs: Data

A number of lakes have been drilled or are in the process of being drilled and studied (Lake E, Baikal, Malawi, Van)

NEEM

EPICA (all 8 interglacials), Dome Fuji

US project drilling W. Antarctica

Marine—Chatham Rise (via QUEST); Iberian Margin (IODP)

German initiative on past interglacial dynamics (INTERDYNAMIK)

Science Programs: Modeling

QUEST QUATERNARY (intermediate complexity modeling of last 130 kyr)

QUEST Desire (FAMOUS modeling of “zoo” of interglacials)

NCAR Last interglacial modeling (snapshot and transient)

PMIP? (unclear if PMIP2 will be taking on modeling of past interglacials; PMIP2 SSC met in Sep. and proposed modeling of last interglacial. Discussion of this will be focus of session at PMIP2 meeting in fall 2008)

Meetings/Workshops

ESF conference proposal on “Stability of Warm Phases in the past and future” (pending)

AGU Fall 2007—long continental records

INQUA MIS 11

PIGS

Report from Group 2: Regional climate reconstructions during the past 2k

Villalba; Battarbee, Ding, Francus, Turney, Whitlock, Zhou

We recognize the need to:

1. Reduce uncertainties in proxy record development and calibration procedures.
2. Develop new records able to capture the whole range of annual seasonality. Most proxy records are influenced by summer climate conditions and they reflect summer rather than annual variability. Fall and winter climate conditions are rarely recorded by proxies (except historical records).

3. Develop new records in regions with scarce or no proxy records at all.
4. Use similar methods in the treatment of the raw data to develop regional reconstructions, with the goal to make regional reconstruction efforts comparable.
5. Evaluate changes in mean climate states in conjunction with climate variability.

We suggest:

In addition to the Proxy Uncertainties Workshop to be held in Trieste, Italy in June 2008, additional workshops to:

1. Coordinate the methods for the treatment of the raw data and the statistical procedures for calibration and verification of the regional reconstructions among all the regional reconstruction groups, in order to be able to make comparisons between areas. PAGES can help facilitate this standardization of methods and procedures (e.g., how to use historical records quantitatively).
2. Intensify paleoclimate studies in regions of high vulnerability (“hotspots”) to climate change, based on IPCC projections, and review variability of 2k climate within those areas. Facilitate the development of new research groups within these regions in order to obtain the data that is still needed. An implication of this would be to increase future interaction with IPCC.
3. Evaluate the effect of human activities on proxy-record signal/noise ratio. The goal is to increase interactions between PAGES Foci 2 and 4.

The group also recommends:

Facilitating the formation of regional groups in areas not presently included in PAGES regional climate initiative, such as Africa and the Middle East, through scientific training in recognized international institutions, PAGES visiting scientist program, and courses in the areas of interest.

Open discussion:

- Arctic group based on lakes and tree rings—spatial variability in climate over 2k.
- Multiproxy lake study—need to measure seasonality, i.e., how do you measure winter; limitation on reconstruction of seasonality—need proxy sensitive to changes in seasons.
- Climate variability, feedback and drivers—joint workshop between Focus 2 and 4.
- Human impact on proxies is not well controlled for; need to remove human influence to extract pure climate signal.
- Are we changing the mean state of environment or changing the variability?

Report from Group 3: Paleoceanography/Ocean Biogeochemistry

Cacho; Fischer, Nakatsuka, Wang

The discussion centered around three main topics:

1. *Micro and macro nutrient cycles:* Iron fertilization. Results from integrated projects on natural iron fertilization with paleoceanographers working in the NW Pacific are not conclusive in supporting the idea that increased dust/iron transport in the region enhanced primary production. In this area, and in others in the Pacific, iron fertilization seems to occur mostly through intermediate waters. We do not really have a proxy for iron fertilization but nitrogen fixation could be better explored with paleo proxies and could be a good indicator of biological changes.
2. *Ocean acidification:* The paleocommunity is making major progress on this front with the development and application of new proxies. In addition, micropaleontological studies of coccolithophores have great potential in this field. The acidification problem is becoming one of the central topics of other IGBP programs, such as SOLAS and IMBER, but PAGES has the potential to add the temporal perspective.
3. *Dust transport:* Models cannot properly parameterize the volume of dust that the atmosphere is capable of transporting. This is needed to accurately interpret the dust record in ice cores.

Considerations and recommendations:

1. Interactions with SOLAS projects could contribute to the development of new tracers for biogeochemical processes.
2. Ensure that paleo work on acidification is transferred to other communities working on this problem and that future research is planned in collaboration. Communication and exchange between researchers from PAGES and SOLAS-IMBER is critical.

Report from Group 4: High- to mid-latitude climate interactions

Powell; Brigham-Grette, Kershaw, Lowe, Rousseau

1. The group recognized the complexity and breadth of the topic and resolved not to attempt to consider the whole subject but to identify a key issue that would benefit from the combined attentions of PAGES and INQUA.
2. It was agreed that more pressing questions concerned high- to *low*-latitude climatic teleconnections and the bipolar orchestration of climate interactions.
3. The group noted that Julie and Ross were to be co-conveners of a session on the bipolar seesaw at the International Geological Congress (IGC) in Oslo, Norway in Aug. 2008.
4. INQUA's interest in such a topic would be on a range of timescales, including the full Quaternary period and suite of glacial-interglacial cycles, Dansgaard-Oeschger variability in the last glacial cycle, and decadal (e.g., ENSO) climate variations.
5. It was agreed that attempting to address questions of process, forcing mechanisms, etc. would amount to "running before walking", and that the initial focus would need to be on the synchronization of records and the associated problems.
6. The group recommended that a joint PAGES-INQUA workshop on the topic "Bipolar Synthesis: Synchronization of records at different timescales" be annexed to the forthcoming IGC meeting.
7. The group further recommended that PAGES and INQUA, separately and jointly, robustly publicize this workshop and actively recruit key people as keynote participants in the workshop.