

SSC MEETING

Nagoya, Japan, 7-8 June 2010

PRESENT SCC

Fátima Abrantes, José Carriquiry, Steve Colman, John Dearing, Zhongli Ding, Pierre Francus, Alan Mix, João Morais (IGBP), Takeshi Nakatsuka, Bette Otto-Bliesner (Co-Chair), Denis-Didier Rousseau, Michael Schulz, Chris Turney, Mohammed Umer, Heinz Wanner (Co-Chair), Cathy Whitlock

PRESENT IPO

Thorsten Kiefer (Executive Director), Louise Newman (Science Officer), Anand Chandrasekhar (Project Officer)

GUESTS

Hubertus Fischer (incoming Swiss Co-Chair)

ABSENT

Eric Wolff

SUMMARY OF DECISIONS AND ACTIONS

Decisions

SSC unanimously approved the minutes from past meetings.

SSC approved the 2010/2011 budget.

SSC suggested Ray Bradley and John Dearing for the organizing committee of the Global Change Open Science Conference (OSC) 2012.

IPO will send out PAGES Working Group (WG) status reports annually and closer to the SSC meeting.

Holocene network will be retained as an idea for a future network and viewed as a long-term project to be developed as a contribution to AR6.

SSC will seriously consider terminating PR Challenge as a PAGES Working Group (WG).

SSC will follow the development of DIRTMAP and go ahead with a 2nd ADOM workshop.

NICOPP WG will proceed as planned.

Ocean Acidification WG will proceed as planned.

SSC decided against producing a Paleochronology table for the CCT1 website.

Varves WG will proceed as planned.

John Dearing was designated as co-leader of Modeling CCT3 to help push non-climatic modeling aspects.

SSC members (re)assigned themselves to appropriate Foci and CCT to ensure leadership from within the current SSC:

Focus1 – Hubertus, Cathy, Eric, Alan

Focus2 – Heinz, José, Fátima, Steve, Chris, (Claudio Latorre)

Focus3 – Michael, Zhongli, Bette, Denis-Didier, Takeshi

Focus4 – John, Mohammed, Cathy

CCT1 – Pierre, Steve, Chris

CCT2 – Fátima, José, Alan, (Claudio Latorre)

CCT3 – Michael, Bette, John

PAGES will forge a relationship with IODP.

EXCOM will consider endorsing the Glacial Ocean Atlas project, following formal application.

PAGES will not endorse the educational event on Open Access in Brest, France.

SSC meeting will be held after INQUA and 2k Network meetings on the 29-30 July 2011 in Bern.

PAGES will set up a panel for outlining a process towards developing future directions for PAGES.

Actions

Thorsten to clarify if NOAA will still be contributing to PAGES in the next funding term.

IGBP to consider Ray Bradley and John Dearing for the OSC Organizing Committee and contact them if appropriate.

IPO to clarify in guidelines that a minimum level of activity is expected from PAGES WGs.

Cathy to be made a co-leader of the Palaeofire WG.

Hubertus to contact relevant people to gauge interest in a Solar Forcing WG.

PAGES to offer “fast-track” support to 2k groups (as already outlined in 2k Network discussion, section 4). Louise and Heinz to contact all 2k groups regarding extra support for AR5-timed products.

Leadership of Antarctic and N. America 2k to be organized and N. America to be pushed to hold a regional workshop.

IPO to offer endorsement of Glacial Atlas Group.

IPO to send a message about consideration to terminate the PR Challenge as a PAGES WG.

IPO to communicate product ideas to the Global Monsoon WG and let them decide on appropriate product format.

Louise to suggest Africa2k members to attend/contribute to SynTRace meeting.

Michael to notify PIGS of SSC comments on the need to be more focused in their meetings and products.

Thorsten to discuss SSC comment on termination of the BIPOMAC WG with co-leaders and then inform on final decision.

John to push the further implementation of the Focus 4 Themes as discussed.

Eric to initiate Sea Ice WG.

Fàtima and José to identify monitoring programs for PAGES collaboration.

IPO to check the flagging of meetings for CCT, and flag the white papers to CCT publications.

Thorsten to initiate connection with IODP. Alan, Michael and Fàtima to follow up and maintain.

PAGES co-chairs and IPO to correspond with CLIVAR and with panel co-chairs on how to achieve better CLIVAR presentation and a regular assembly of the panel.

Heinz to invite a PMIP representative to attend the 2011 2k Network meeting.

Exact details of next EXCOM meeting to be discussed by EXCOM via email.

IPO to invite Alan and Steve to the end-of-year EXCOM meeting.

SSC to think about potential ideas for joint PAGES/EGU topical conferences and forward them to Denis-Didier.

Louise to contact John regarding possible timing of F4/IHOPE issue, Takeshi about the timing of a regional Japan issue, Mohammed about the timing of a joint WAQUA/EAQUA issue, and to follow up with SSC for suggestions of guest editors for the Abrupt Climate Change issue.

US members on the SSC to discuss options for a US PAGES Panel.

IPO to set up webpage to complement the IPCC website with condensed information tailored to the paleoscience community.

Pierre to initiate the process of creating/compiling a PAGES perspective to counter climate deniers.

IPO to make appropriate changes to the OSM hosting questionnaire as suggested by the SSC.

IPO to advertise an open call to host next OSM/YSM and send to pre-interested parties.

1. Introduction & Miscellaneous

Bette chaired the morning sessions of the first and second day, Heinz chaired the afternoon sessions. Bette welcomed everyone to the meeting and thanked Takeshi Nakatsuka for organizing the Regional Japan workshop and SSC meeting.

Corrections to the Agenda:

- Fátima Abrantes comes from Portugal not USA as listed

1.1 Approval of Minutes from Past Meetings

Decision **SSC unanimously approved the minutes from past meetings**

1.2 New to PAGES

Three SSC members and one IPO staff were new to the group, thus all attendees introduced themselves and Bette welcomed the new members.

2. Finances

2.1 Funding Overview

Thorsten outlined the details of the funding requested in the proposals recently submitted to the Swiss and US National Science Foundations (NSF) for the next funding period (2010 – 2014). Thorsten also highlighted that the Swiss NSF had approved full funding and that PAGES was awaiting an official approval of funding by the US NSF. Thorsten then outlined the additional support of IGBP, the in-kind support of the University of Bern, and the separate project funding for PAGES participation in the EU-FP7-project Past4Future.

2.2 Budget Overview 2010/2011

Thorsten provided an overview of the budget details for the upcoming fiscal year, highlighting the increase in money available for scientific activities and the decrease of the fraction of the budget that goes into IPO sustenance. The role of NOAA funding in the new grant period was also discussed.

Decision **Budget approved**
Action **Thorsten to clarify NOAA funding**

3. IGBP Update

João gave an overview of the 3 main issues currently being addressed by the IGBP secretariat:

1) IGBP's vision

João reported that an IGBP strategic vision is still being developed indicated that it will place emphasis on linking science to societal needs. Key issues are 1) Understanding natural Earth system function, 2) Interaction of human activities with the Earth system, and 3) Solutions – how can new and existing research findings most effectively inform management, policy etc.

João also outlined the five major global sustainability challenges that ICSU identified in a recent survey (www.icsu-visioning.org/open-forum): Forecasts, Observations, Adaptation, Governance, and Technology. João also described the upcoming Open Forum meeting (22 June 2010, Paris), which will explore implementation and delivery of the challenges, including discussions of the institutional frameworks required, funding, regional perspectives and policy relevance and communication.

2) IGBP Synthesis Products and links to PAGES

João summarized the topics to be covered in the IGBP second synthesis “Planet under pressure: knowledge and solutions”: The Cryosphere, Megacities in the coastal zone, Needs of least developed countries, Changing nutrient loads in coastal zone and open ocean, Nitrogen and climate, Geoengineering, Land-use-induced land-cover changes, Air quality, Adaptation. Synthesis products (journal publications, fact sheets, video etc) are expected from each of these topics. A rationale of each of the topics is available on the website (<http://www.igbp.net/page.php?pid=510>).

João remarked that PAGES should contribute to the “Adaptation”, “Nitrogen and climate” and “Land-use-induced land-cover changes” topics, and raised the question whether the SSC could see more emerging, cross-cutting and visionary topics that PAGES could contribute to.

Denis raised the point that PAGES could contribute to the “Aerosols” project but it was mentioned by Bette that the emphasis of this topic was more on organic aerosols. Bette also highlighted that the newly reinstated “Cryosphere” topic had changed focus and now has more of a society and biosphere impacts focus. John offered that Focus 4 members should be included on the Steering Committee of the Land use topic, and suggested that PAGES should make it clear that they can provide the baseline standard for topics such as “Air pollution” and “Nitrogen”. Bette added that she has been asked to serve as a member of the steering committee of the IGBP Land Use topic. Workshops are being planned for the implementation of this topic. The linkage between IGBP synthesis products and timing and needs of the IPCC report were also discussed.

João also highlighted other integration and communication products that IGBP were contributing to, including a presentation on “What is dangerous climate change” by Rik Leemans, the Planetary Boundaries publication in Nature in 2008, and a YouTube video on the “IGBP Climate Change Index”.

The SSC discussed the need for improved communication of the science to the public, and it was highlighted that IGBP has a communication team that is better trained to confront this matter.

3) Global Change Open Science Conference 2012

João provided details on the upcoming OSC, highlighting that it will focus on global change solutions, and is intended to influence the 2012 Earth Summit of the United Nations. The OSC will probably be held in February or May 2012 in London, and will cover the questions: What do we know? What do we need to know? What does this mean for the future of society? What do we need to do? João also asked the SSC to put forward 1 – 2 names of paleo-researchers that should be invited to sit on the organizing committee of the conference. These representatives will be responsible for communication of session topics and crosscutting issues.

The SSC discussed the involvement of the other ESSP programs in the conference, and how the OSC will influence the Earth Summit. A point was raised that previous IGBP input into the Earth Summit was rushed and that IGBP should develop a better timeline for document preparation this time. João noted that he would communicate this to the IGBP Secretariat.

The SSC suggested Ray Bradley and John Dearing for the organizing committee of the OSC. John accepted his nomination but mentioned that it should be considered that he is also on the local organizing committee.

Decision **Ray Bradley and John Dearing suggested for OSC organizing committee**

Action **IGBP to consider these suggestions and contact Ray and John if appropriate**

4. PAGES Research Activities

The new procedure of Working Group Status Reports was outlined, and it was suggested that the reports be requested from the Working Groups before SSC meetings. It was put forward that, although

WG are bottom up, they do represent implementation of PAGES science and therefore the SSC should make sure they are achieving their goals, and make suggestions for improvements. It was also noted that a few WG are currently not active and may need to be “sunsetting” or injected with new people to help push for progress. During the day’s discussions it became clear that PAGES should think of consistent criteria and a procedure to treat (e.g., sunset) non-active WGs.

The SSC was encouraged to look closely at the Foci and CCT to identify any important topic not currently covered by a WG. All SSC members were requested to get involved as initiators and oversight co-leaders of Foci and CCT.

Decision **IPO to send out status reports annually and closer to the SSC meeting**

Action **IPO to clarify in guidelines that activity is expected from PAGES WGs**

Focus 1: Climate Forcings

PALSEA

Bette reported on the status of PALSEA. In particular it was highlighted that they will hold a workshop with PMIP and PIGS in 2011, and currently have links and contribute to PMIP, PIGS, the EU projects Past4Future and Ice2Sea and the US-based project SeaRISE (Sea-level Response to Ice Sheet Evolution). Thorsten also mentioned that PALSEA are seeking to increase their funding base and may become less and less dependent of the base funding from PAGES and IMAGES.

Global Palaeofire

Cathy reported on the Global Palaeofire working group, an IGBP cross-project initiative of AIMES, PAGES, and iLEAPS. Major publications were highlighted, including the upcoming special issue of the PAGES newsletter. Plans for an African Palaeofire workshop had been delayed indefinitely, and an assessment was made that there wasn’t the required threshold of researchers in Africa to support such a meeting. The SSC discussed the effect of the end of the QUEST project and the role that PAGES should play in pushing this working group forward. A new paleofire project funded by NSF and led by Cathy would be organizing a number of paleofire workshops. The leadership of this WG was discussed and it was noted that Cathy Whitlock should be listed as a leader, alongside Mitchell Power and Sandy Harrison. It was also noted that this WG also contributes to Focus 4.

Action **Cathy to be made a co-leader of the Palaeofire WG**

Discussion on new workshops or WG’s under Focus 1

Solar Forcing:

The SSC discussed the need for, and steps towards the development of Volcanic and Solar Forcing WGs. Names were put forward for potential leading members of a Solar Forcing WG included J. Beer, J. Stoner, S. Solanki, and E. Bard, Y. Guyodo. The key goal would be to produce an agreed upon curve (with uncertainties) that can be used to force models. For that, only a small, focused WG is needed. A main task would be to convert Be and ¹⁴C records to W/m². The SSC discussed developing a small focused group to address these immediate goals, in addition to a larger WG that could address longer-term goals.

Volcanic Forcing:

The SSC discussed the state of research in Volcanic forcings and what would be required from a potential WG. It was agreed that as new records of volcanic forcing are in the process of being generated and as the quantitative translation of volcanic activity into forcing is still a problem, it was too early for a WG on this topic and that PAGES would start with developing a Solar WG first.

Action **Hubertus to contact the relevant people to gauge interest in a Solar Forcing WG**

Sea ice:

Thorsten reminded the SSC that Eric Wolff had volunteered to move this forward and has recently committed to start a WG on sea ice proxies and reconstruction. Eric will contact Leanne Armand who had expressed interest in such a group. The SSC discussed that this WG should also include researchers working on diatom biomarkers (e.g., Tim Shanahan).

Orbital:

The SSC discussed the possibility of developing an Orbital WG, akin to SPECMAP. At a recent ERC project workshop on Integrating Theory and Observations over the Pleistocene led by Michel Crucifix, the opportunities and needs to develop a glacial-interglacial record inventory and/or reference curves were discussed. It had been concluded, however, that such an initiative was not needed at present.

Focus 2: Regional Climate Dynamics

2k Network

Heinz informed the SSC of the recent advances in the 2k Network, including recently held or upcoming meetings, and recent problems with the leadership of a number of the groups. The leadership of the N. American 2k group was discussed in detail. Ray Bradley had accepted an overseeing role. It was also noted that this group had not yet planned a regional workshop.

The SSC then discussed the importance of intermediate products, published in time for AR5. In particular, the development of cross-regional products (e.g., ENSO record, S. Hemisphere curve) and regional syntheses were highlighted as important potential contributions to AR5. It was agreed that PAGES should encourage all groups that have the capacity to produce intermediate products in time for AR5, to do so. PAGES should thus notify all regional groups that we are committed to support extra workshops before the INQUA Congress, if these are needed to push through synthesis publications by the IPCC deadline, highlighting that this support also includes cross-regional syntheses. An associated discussion was had during the IPCC agenda item (see section 10 below).

Thorsten also informed the SSC of plans of David Anderson and Gene Wahl (NOAA) for an international effort, including involvement of PAGES, to create a large pool of international funding to run 2k reconstructions.

Action Louise and Heinz to contact all 2k groups regarding extra support for AR5-timed products

Action Leadership of Antarctic and N. America 2k to be organized and N. America to be pushed to hold a regional workshop

Holocene

Darrell Kaufmann is running a new project on reconstructing Holocene paleoclimate in the Arctic and will visit the PAGES office in 2011 as a guest scientist. Given that Heinz is now also in the PAGES office, there will be a good opportunity to set up a multi-regional Holocene network similar to the 2k Network. Heinz informed that he does currently not have the capacity to lead a whole Holocene network. The SSC then discussed linking any Holocene effort with other active groups (e.g., SynTRaCE Holocene database and European Past4Future database on interglacials). It was acknowledged that many of the people involved in the 2k Network would also need to be involved in any Holocene initiative and thus the Holocene Network should be viewed as a longer-term project, to be developed as a contribution to AR6.

Decision Holocene network to be kept as an idea for a future network

Glacial

Michael commented that this theme is not entirely completed, as indicated in the WG timeline diagram. A group called “Glacial Ocean Atlas” has developed out of MARGO with the aim of synthesizing deep ocean data for the LGM. This group is already active but may be interested in PAGES endorsement. This suggestion was added to the agenda of the next day (see section 5).

Action **IPO to offer endorsement of Glacial Atlas group**

PR Challenge

Focus 2 has a methodological component, which is currently supposed to be covered by the PR Challenge as part of the PAGES/CLIVAR Intersection. The SSC then discussed the lack of visible progress in the PR Challenge and of communication with PAGES. It was suggested that the PR Challenge should be “sunsetting” as a WG of PAGES because its inactivity reflects badly on PAGES and PAGES has effectively no input. Thorsten highlighted the fact that the PR Challenge is a component of the PAGES/CLIVAR Intersection, and that PAGES was included in the PR Challenge funding proposal. It is suggested that the EXCOM communicate with the leaders of the PR Challenge of possible “sunsetting” if inactivity continues.

Action/Decision **IPO and Chairs to communicate to PR Challenge leaders the considerations to terminate the PR Challenge as a PAGES WG**

Focus 3: Global Earth-System Dynamics (T. Nakatsuka, E. Wolff, M. Schulz, Z. Ding)

Global Monsoon

Zhongli updated the SSC on the status of the Global Monsoon WG, highlighting that many issues on the modeling, forcings and linkages of regional monsoons remain to be understood. Thorsten reminded the SSC that PAGES/CLIVAR Intersection also drives this WG, and that Bin Wang, a co-leader of the WG, is a CLIVAR panel member. The SSC then discussed the need for this WG to produce a product, such as a PAGES newsletter issue, a journal special issue, and/or a synthesis paper (e.g. on connecting regional monsoon aspects). It was noted that a journal issue would be good for its peer-reviewed status but that these issues can often be fragmented and disjointed and that a synthesis or overview article would also be needed. It was also put forward that since this WG is not just paleo, any product would make an interesting PAGES newsletter issue (or PAGES/CLIVAR Intersection newsletter), which is perhaps a more digestible format for cross-disciplinary products than a journal special issue. Further, it was highlighted that this newsletter issue could act as a “stepping stone” towards a synthesis paper.

Action **IPO to communicate product ideas to the Global Monsoon WG and let them decide on appropriate format**

ADOM

Denis-Didier provided the SSC with an update on the first ADOM workshop. The SSC then discussed issues of reconstructing dust loading, and highlighted links to the DIRTMAP community. It was also noted that DIRTMAP is currently not active and that it is important that the development of a Dustiness database is not forgotten. Hubertus highlighted a recent meeting that aimed to reinvigorate the DIRTMAP effort and produce global dust fluxes, but that no final decisions were made.

Decision **Observe the development of DIRTMAP and go ahead with a 2nd ADOM workshop**

SynTraCE-21

Bette outlined the previous two SynTRaCE meetings that including contributions by terrestrial and marine proxy researchers, intentions for a synthesis paper for the deglaciation (led by P. Clark) and the development of a database for synthesis at NOAA. Bette then outlined the idea of the upcoming meeting in Oct 2010, which will include international components, discussion of terrestrial/ocean

records and involvement of more transient modeling. It is then intended that the WG will hold smaller focused workshops in 2011. Chris reminded that SynTRaCE should communicate and build on resources of the INQUA-INTIMATE groups, which are also addressing the last deglaciation.

Action **Louise to offer Africa2k members to attend/contribute to SynTRaCE meeting**

PIGS

Michael reported on the upcoming meeting on regional expression of the magnitude of interglacial warmth and interglacial duration, and informed that the final workshop will be held in 2011 towards explaining interglacials from the climate forcing. The published review paper and upcoming synthesis paper were highlighted. It was suggested that this group should be encouraged to organize the workshops in a more focused way with clear questions and product goals. It was also added that PIGS should endeavor to be more integrative.

Action **Michael to notify PIGS of SSC comments and their need to be more focused in their meetings and products. Note – this has since been done and PIGS have acknowledged these comments and will address them in upcoming meetings.**

NICOPP

Thorsten outlined the progress of the new WG and the recent workshop, which discussed methodological issues and data compilation. The next steps for this WG are to compile surface sediment data, then the down-core nitrogen isotope data, produce a paper on diagenesis of isotopes (led by R. Robinson), a poster at the Conference of Paleoceanography on core-top compilation, an Eos article, an AGU 2010 session, and a PAGES newsletter workshop report.

Decision **WG should proceed as planned**

Ocean Acidification

Thorsten informed the SSC that this new group is led by paleo people but also includes modern researchers, and recently received NSF funding for the workshop upcoming in Aug 2010.

Decision **WG should proceed as planned**

BIPOMAC

This WG still has no real structure, timeline, goals, and no official active leadership. The proposed leaders (Rainer Gersonde, Julie Brigham-Grette and Ross Powell) have maintained some uncoordinated activity over the last years, and expressed their interest in engaging in BIPOMAC but didn't act on the recent invitation for a formal concept for a PAGES WG. The SSC noted that last year's status report provides no real proof of concept and that the WG had already received a warning note and should thus be removed as a PAGES WG.

Action **Thorsten discuss SSC comment with co-leaders and then inform on decision**

Focus 4: Human-Climate-Ecosystem Interactions (J. Dearing, M. Umer)

John led the discussions on each of the Focus 4 Themes. He summarized that Focus 4 is presently active but that this activity is patchy and leadership is an issue in some Themes. Many Themes are moving ahead and should result in some good products. Thorsten raised the issue that the Theme's leaders are mostly only from one WG, contrary to the original idea that Themes are addressed across WGs. John replied that there is some overlap between the WGs but for some Themes it was not relevant.

Regional Integration

Regional Integration is organizing an upcoming workshop with the aim to bring together the communities working on different parts of ecosystem, to start to look at interactions between ecosystem

processes and states of past environments, and to imbed this knowledge within a socioeconomic framework. The idea is to develop 2-3 demonstration projects that show how all these communities can be drawn together, resulting in publishable products. This Theme is also working with the Global Land Project, and currently has a paper accepted (Dearing, J.A., et al., submitted: Complex land systems: the need for long time perspectives in order to assess their future, *Ecology and Society*, subject to revision) looking at need for long timescales in studying processes.

Water

This Theme is led by Roland Hall and Peter Gell and is currently based around the paleolimnology community. Presently there is not much happening towards progress of this project.

Soil and Sediment

This Theme is linked to the LUCIFS WG. A workshop is being planned for 2011 and a paper, setting out the soil and sediment theme, was recently published (Hoffmann, T., et al., in press: Human impact on fluvial regimes and sediment flux during the Holocene: Review and future research agenda, *Global and Planetary Change*). Recently there have been leadership changes in LUCIFS with Nick Preston stepping down, leaving the lead to Thomas Hoffmann.

Biodiversity

Kathy Willis and Shonil Bhagwat had agreed to take over the leadership of this WG, and although they have been pushed to structure activities, nothing has yet resulted. They are producing prolific papers on the value of long-term records of biodiversity, including one submitted to the *Climate of the Past* OSM special issue. However these papers were not done as a coordinated part of the PAGES Biodiversity Theme.

Land Cover

This Theme links to the active HITE community and is led by M.J. Gaillard. There is currently a workshop application to be considered looking at spatial reconstructions of land use in Asia. A further meeting is planned for 2011 and preliminary papers have already been submitted to *Climate of the Past* (OSM special issue, now published) and *The Holocene*. Bette suggested ensuring that M.J. Gaillard is included in the IGBP synthesis product on Land Use and Land Cover and that perhaps this group would benefit from links with iLEAPS. Mohammed also added that a relevant paper by Rob Marchant titled "Paleoenvironmental perspectives for sustainable development in East Africa" initiated at the Focus 4 symposium at the Corvallis YSM/OSM has been submitted to the OSM special issue in *Climate of the Past*.

Carbon

This Theme is not yet organized but a coordinated scoping paper on the challenges of using paleoenvironmental archives to produce terrestrial carbon budgets through time is being prepared (led by John Dearing) for submission during July/Aug 2010. This will clarify where a WG should be devoting their time and might open up ideas of key people to run it.

The SSC discussed possible scopes of this Theme. This included the development of not only proxy-based evidence of carbon accumulation but also vegetation and global carbon modeling. Also discussed was the consideration of soil carbon and living biomass carbon, and fluxes of carbon to the continental shelves, to aid in balancing of nutrient budgets.

Action John to push the further implementation of the Focus 4 Themes as discussed

CCT1: Chronology (P. Francus, S. Colman, C. Turney)

Pierre outlined recent CCT1-related activities, including: INQUA Tephrochronology workshop, EGU session on Advances in Quaternary Geochronology, INTIMATE workshop, PAGES Varves WG Workshop, and the PALSEA dating of interglacials workshop. Further, he highlighted the application

for funding for the “Paleochronology building workshop” that has potential to develop into a PAGES WG, and the current development of the CCT1 and Varves WG website.

Pierre then outlined the idea behind the Paleochronology table for the CCT 1 dynamical website and requested SSC feedback. The SSC discussed the idea, in particular the spatial variability in records of certain events, the amount of work required to develop and maintain such a table, the selection process of appropriate references and records, and likely end users. It was agreed that this activity would be problematic.

Decision Not to produce Chronology table

Varves WG

Pierre summarized the outcomes of the first Varves WG workshop and informed the SSC on future goals of this group. These goals include involving and learning from research of other annually deposited archives, which will be the focus of the second WG workshop (Spring 2011, USA). This workshop will involve researchers from many communities: Tree rings, corals modeling, data assimilation, statistical techniques (Bayesian), and the INTIMATE community. Other workshops are also planned and will focus on establishing standards of best practice for the study of varved sediments, and specific themes, such as climate events and climate variability. The intended products of the WG are a special issue in *Quaternary International*, ILIC (International Limnogeology Congress) and INQUA 2011 sessions, a metadatabase of varved records, an atlas of varved and non-varved images, a hand book or website with standards of best practice, and training courses on methodological aspects of the analysis of varves.

Decision WG should proceed as planned

CCT2: Proxy Development, Calibration and Validation (R. Villalba, F. Abrantes, J. Carriquiry)

José reminded the SSC that presently there is no WG within this CCT and that it is an aim of the CCT to start movement in this Theme. One firmly intended activity is the establishment of a sea ice group under the lead of Eric Wolff. Thorsten clarified that in the case of the relatively broad CCTs PAGES needs to initiate WGs or workshops top-down only if there are immediate scientific issues that need addressing, but in general suggestions and initiative should come from the community.

The SSC discussed the possibility of CCT2 contributing to observation systems, where there is currently no focus on paleo applications. Alan highlighted that one practical use of such collaboration is in proxy calibration and suggested that PAGES should make connections between programs and then allow interested individuals to move forward with collaborations.

Chris suggested development of the website to make it a resource for scientists, similar to CCT1, with introductions to various methods.

Action Eric to initiate Sea Ice Working Group

Action Fátima and José to identify monitoring programs for PAGES collaboration

Action IPO to check the flagging of meetings for CCT, and flag the white papers to CCT publications.

CCT3: Modeling (M. Schulz, B. Otto-Bliesner)

Michael summarized recent activities of CCT3. He stated that a workshop is not needed at the moment, but that this CCT should move forward through sessions at large meetings (e.g., EGU). Several related activities will also be taking place, including PMIP and AR5 workshops on data-model comparison. It was suggested that this CCT should also consider the modeling of non-climatic processes (ecological change, human impact), which is proving to be a challenge to model over long timescales, and modeling tools are under developed. There is a community working on these problems but they need to be brought together. It was also added that IPCC WG2 would have a strong need of such results.

Decision **John to be co-leader of Modeling CCT to help push non-climatic modeling aspects**

CCT4: Data Management (T. Kiefer)

So far, the IPO has not had the capacity to further develop the paleodata portal but a number of metadatabases have been developed. Thorsten also suggested that it would be timely to hold a Databoard meeting but that the group has lost momentum. It was suggested that a key contribution of CCT4 would be not just to provide the metadatabases but also to motivate people to put their data into databases. This could be done through provisions of guidelines for data submission and highlighting the benefits of data submission (e.g., increased citations), and through targeting early career researchers through the various networks. A paper could also be written on the subject.

Lead of Foci and CCT

It was discussed whether past SSC members should still be involved in the leadership of Foci and CCTs or whether they should be eliminated from the leadership after rotating off the SSC.

No final decision was made but the SSC members (re)assigned themselves to the Foci and CCT in a balanced way that should assure leadership from within the current SSC.

Decision **F1 – Hubertus, Cathy, Eric, Alan; F2 – Heinz, José, Fátima, Steve, Chris, (Claudio Latorre); F3 – Michael, Zhongli, Bette, Denis-Didier, Takeshi; F4 – John, Mohammed, Cathy; CCT1 – Pierre, Steve, Chris; CCT2 – Fátima, José, Alan, (Claudio Latorre); CCT3 – Michael, Bette, John**

5. PAGES links to other projects

IMAGES (The International Marine Past Global Change Study)

Thorsten provided an update on the status of IMAGES. It was stated that IMAGES has lost the ship-based focus of its mission, as long sediment coring technology is now available elsewhere. IODP and coring programs in general are struggling for money. It was suggested that PAGES should be forward thinking and integrate the wider marine scientific community into PAGES. PAGES should strengthen the links to the most active marine groups and link with the IODP environment board. The IODP scientific vision is similar to PAGES. They are currently scoping their 2013 – 2023 science plan, to which PAGES could give input. The SSC discussed this issue, in particular the usefulness of such a link for smaller countries that do not have direct access to drilling facilities. It was suggested that the IPO should approach IODP and suggest establishing links with the IODP environment board. The ICP10 Paleooceanography conference in late Aug/early Sep 2010 could be used for direct communication and possibly the drafting of a White Paper.

Decision **PAGES to forge relationship with IODP**

Action **Thorsten to initiate connection with IODP, Alan, Michael and Fátima to follow up and maintain**

IPICS (International Partnerships in Ice Core Sciences)

Hubertus reported on the status of IPICS research and outlined the goal for the Antarctic2k/IPICS 2k group to be consolidated and produce a data compilation within a year.

PAGES/CLIVAR Intersection

Bette informed the SSC of the goals and plans of the PAGES/CLIVAR Intersection and then highlighted some recent issues. One issue is that the panel membership consists predominantly of

PAGES people. It therefore appears to be a subset of PAGES rather than an intersection of both projects. Accordingly, workshop organizers also seem to be predominantly PAGES people. The SSC discussed the way forward and suggested that PAGES encourage more CLIVAR participation and that the Intersection panel should hold more regular meetings, which would ensure participation by those that are keen to be actively involved.

Action **PAGES co-chairs and IPO to correspond with CLIVAR and with panel co-chairs on how to achieve better CLIVAR presentation and a regular assembly of the panel**

IHOPE (Integrated History of People on Earth)

John gave an outline of the goals of IHOPE and mentioned the upcoming IHOPE-SSC meeting in September. He highlighted that IHOPE was looking at the potential to model past civilization changes (e.g., an analysis of systems not just an analysis of certain civilizations) with a tendency to look at the past as an analog. It was mentioned that the scientific origin of the IHOPE project idea is rooted in archaeology and historical environmental research, not so much in paleoscience, which explains the approaches and focusing that is often different from that of PAGES.

Group on Earth Observations (GEO)

Thorsten detailed the aims of the GEO program and outlined PAGES input. João inquired whether links with the IGBP Task Force on Observations (chaired by D. Schimel, AIMES SSC) would be useful, and Thorsten informed that this had been considered at the recent IGBP SC meeting but that PAGES is perhaps not the right organization to actively contribute to observational networks.

PMIP (Palaeoclimate Modeling Intercomparison Project)

Bette outlined the upcoming science in PMIP, including model data comparisons, new data syntheses (including new people from the data community – 2k people) and sensitivity simulations. She informed that paleo-model runs would go into the CMIP5 database. It was added that it would be important to have at least 1 PMIP person included in the 2k Network meeting in Bern, 2011.

The sister project PCMIP is still in an establishment stage, so it is still unclear whether or at what level it would fit into PAGES.

Action **Heinz to invite a PMIP representative to attend the 2011 2k Network meeting**

EU Framework Program 7 project “Past 4Future”

Thorsten reported that PAGES is an official partner in this new collaborative project. PAGES role in the project is on the integration and dissemination of results, which involves website hosting, newsletter production and participating in a stakeholder review. The project is linked with several of PAGES WGs (e.g. PIGS, PALSEA). The SSC acknowledged this PAGES involvement as beneficial activity.

Potential new endorsement: “Glacial Ocean Atlas”

Following on from the initial debate (see section 4) Bette outlined the procedure for endorsement, which is described in the guidelines provided by the IGBP.

Michael provided some background on the Glacial Ocean Atlas project and put forward that they would greatly appreciate endorsement by PAGES to help push the project along and, in particular, to get the US community involved. It was discussed how PAGES could facilitate the science of this project with suggestions of support for workshops and publication of reports and updates in the PAGES newsletter. It was agreed by the SSC that GOA should submit a formal application for endorsement.

Decision **EXCOM to consider endorsement of this project, following formal application**

6. Workshops and Meetings

Pending Workshop Proposals

Thorsten outlined the Open Call, Working Group and Educational Meeting proposals that the EXCOM would consider in detail at their evening meeting, and sought feedback and input from the SSC. In the general discussion that followed it was suggested that, if relevant, educational meetings should be asked to provide the educational material (e.g., ppt slides, pdfs) to the IPO so it can be made available for download from the PAGES website.

PAGES Endorsement of educational event on Open Access

The SSC discussed the request for endorsement of this event to be held in Brest. While Open Access is considered by many on the SSC a worthwhile concept, it was felt that PAGES should not endorse this event because (a) it seemed to be set up as a departmental activity without wider international or at least national coordination and hence not following the principles of PAGES; (b) it was found to be beyond PAGES capacity to support any particular publication strategy; this should be done by funders and publishers.

Decision Not to endorse

Upcoming Large Meetings

Bette gave a brief overview of the upcoming large meetings. In the following discussion, the SSC commented on how to better advertize PAGES sessions at large meetings as being “PAGES”. It was agreed that before a large meeting, PAGES should remind WG leaders to incorporate the word “PAGES”, ideally in the title of their sessions. Pierre also enquired whether a geochronology session is already organized for EGU 2011. Thorsten confirmed this and requested suggestions for solicited speakers. Denis also notified the SSC that EGU is offering free use of meeting rooms for short meetings held during EGU (with registration available on the website).

Location and timing of EXCOM meeting 2010

It was decided that the 2010 EXCOM meeting should be held in San Francisco alongside AGU, most likely on the 12 December. Both potential future US Co-Chairs (Steve and Alan) are to be invited to attend the EXCOM meeting.

Action Exact details of next EXCOM meeting to be discussed by EXCOM via email

Action Alan and Steve to be invited to end-of-year EXCOM meeting

Location and timing of SSC meeting 2011

The SSC discussed possible locations and timing of the 2011 SSC meeting. It was agreed that it made most sense to have it alongside the INQUA meeting. A majority voted for 29-30 July 2011, following the INQUA Congress (21-27 July) and the PAGES-2k-workshop (28 July).

Decision SSC meeting to be held after INQUA and 2k Network meetings on the 29-30 July 2011 in Bern

Joint PAGES/EGU Topical Conferences

Denis-Didier informed the SSC that EGU were keen to have meetings co-organized with PAGES, and gave an overview of the aims of a new EGU topical conference series. He highlighted that training aspects are also encouraged, with additional support to be given for summer schools held alongside the conference. Denis-Didier proposed the name “The Shackleton EGU-PAGES conference series”.

The ensuing discussion highlighted the opportunity within the EGU climate division structure to reach an audience beyond the paleo community with these meetings. The question of the required monetary support by PAGES was debated. It was agreed that PAGES could attempt to match EGU funding for the joint meetings, with additional funds for summer schools.

The SSC agreed that such meetings would be a good idea and it was decided that the SSC should come forward with ideas for topics.

Thorsten then reminded the SSC that the Asia-Pacific Network (APN) is also keen to have more involvement with PAGES and are willing to fund ventures for Asian, Australasian and US communities.

Decision **SSC to think about potential ideas for joint PAGES/EGU topical conferences and forward them to Denis-Didier**

7. PAGES Products and Resources

Thorsten provided an overview of pre-existing and new PAGES products, including website statistics, WG websites, the Product Database and National PAGES. Thorsten also asked the SSC for input on the new Outreach website, and raised the question of how PAGES can reach out more to developing countries, from which new subscriptions to PAGES are rare. A suggestion to provide the homepage of the website in a number of different languages was discussed but eventually considered to be of rather limited impact.

Louise summarized the latest newsletter issues and suggested topics for upcoming issues, in particular the IGBP Science topic. This received positive feedback from the SSC.

The SSC then discussed possible topics to be covered in 2011 and suggested that regional newsletters from developing countries could help develop community and strengthen ties of developing countries with PAGES. Takeshi noted that a regional Japan newsletter would be of benefit to the Japanese community. It was also suggested that some communities, such as WAQUA, who do not currently have the capacity to produce synthesis products from their meetings, should produce a newsletter issue, in coordination with EAQUA, and that PAGES would view this as a valid and realistic product to come out of a PAGES funded meeting. Mohammed agreed that such a product would be desirable to the community. Thorsten raised the view that to strengthen ties between PAGES and developing countries, PAGES should make a sustained effort, rather than a one-off regional newsletter. It was decided by the SSC that regional newsletters should only be produced by those communities requiring capacity building, and should not occur more often than once every 4-5 issues.

Potential future newsletter topics include:

- Focus 4/IHOPE
- Japan Paleoscience
- WAQUA/EAQUA joint newsletter on African paleoscience
- Global Monsoon
- Abrupt climate change
- Extreme events
- ADOM (in 2012)
- PaleoENSO
- Biodiversity

Action **Louise to contact John regarding possible timing of F4/IHOPE issue, Takeshi about the timing of a regional Japan issue, Mohammed about the timing of a joint WAQUA/EAQUA issue, and to follow up with SSC for suggestions of guest editors for the Abrupt Climate Change issue**

8. PAGES Communication Strategy

Louise provided a general overview of the development of a PAGES Facebook page, the increase in e-news mail-outs, and the update of the PAGES Wikipedia entry.

Anand presented the plans for the new communication strategy, highlighting the intention to first make the most of what PAGES already does, and then to expand this to develop new ideas to reach other communities. In particular, he highlighted the need to reach out to the American community, early career researchers, developing country scientists, and other stakeholders (e.g., IGBP core projects). He outlined the potential of new media to increase visibility and the “coffee-house” appeal of PAGES.

The SSC discussed these ideas, and suggested several new ones:

- RSS feeds on the website.
- Short video clips (3 min) of scientists highlighting topics/key questions that they are working on, with the target audience of the general/scientific public.
- PAGES highlights in e.g., CLIVAR newsletter (and vice versa).

The capacity of the IPO to develop and maintain these potentially very time consuming activities was also discussed.

The moderate affiliation of the US community for PAGES, and the importance of reaching out to this community, was also discussed. In particular, the idea of developing a US-PAGES Panel or Advisory Board. This Panel would increase visibility, activity and accessibility by acting as ambassadors for PAGES. The AMQUA community is interested in forming closer connections with PAGES, and links with AGU paleo groups and NOAA are also possible. Bette informed the SSC that NSF was in favor of such a Panel and it was suggested that this Panel could also be useful in providing NSF guidance on paleoscience.

Action US members on the SSC to discuss options for a US PAGES Panel.

9. Forward-thinking for PAGES

Thorsten provided the background on why PAGES should start to think ahead, towards possible future developments of PAGES. Several different ideas were discussed, with no particular direction gaining complete consensus yet. These ideas included 1) Strengthening the Focus 4 component of PAGES science to ensure societal relevance, 2) Breaking PAGES into a number of topical “Intersections” based on the model of the PAGES/CLIVAR Intersection, 3) Aiming for one large program based on PAGES/CLIVAR Intersection, covering “past, present and future” in one program.

Individual statements and thoughts were presented during the discussion:

- On the higher program level, large reviews of IGBP and WCRP had called for more convergence and integration. This trend is also apparent during the ongoing ICSU visioning process and might also be relevant for PAGES.
- The most important thing is to provide really good science.
- PAGES needs to take care to maintain the uniqueness of what it contributes to global change science, and that it should protect the niche and provide top quality science within that niche.
- A long-term strategy should better not be devised on policy-relevance, which is difficult to define and variable. Societal relevance on the other hand is a good target.
- Social science is gaining momentum in Global Change science and Focus 4 should strengthen the link with groups with a human/societal focus.
- Another trend in Global Change science is the scaling down from global to regional to meet the policy need for adaptation information. PAGES has been very good at covering all spatial scales.
- PAGES is good at community-building across disciplines, while other projects are more driven by

scientific questions. PAGES should aim to better merge both approaches.

- WCRP and projects within are moving towards PAGES, realizing the importance of paleo. Hence, there is an opportunity to merge past, present and future climate into one time-continuous program, such as a large-scale PAGES/CLIVAR Intersection. Similar setups could be thought of for biogeochemistry and other aspects.
- The physical science basis of global change is not solved yet and should be further addressed with a systems perspective and by looking at the processes.
- PAGES success as an integrating program has largely been the result of the clear definition of the denominator of PAGES science, which is timescale.
- PAGES should do the historical aspects of what is needed to drive the future vision of IGBP.
- PAGES should not break into topical or disciplinary projects, even if those were of intersection-type with neighbouring disciplines.
- A major task will be how to make our science policy friendly; hence a good communication component is important.

To progress beyond this discussion state, it was agreed that a small body of people is needed to outline a structure for the foresight process of PAGES, as a basis for the next SSC meeting. It was suggested that ideas should also be discussed with other communities.

Decision **PAGES to set up a panel for outlining a process towards developing future directions for PAGES**

10. PAGES and the Global Change community

A PAGES platform for IPCC

Thorsten raised the idea of providing the PAGES community with an easy way to “keep in touch” with the IPCC process, through a webpage dedicated to providing up-to-date information on the IPCC process and information. The idea was received well, although it was mentioned that a lot of information was already on the IPCC website and that a potentially bigger role of PAGES would be to ensure that the most relevant information gets into the report.

The SSC then re-addressed the issue of ensuring that the science of the 2k community and PMIP contributes to the IPCC synthesis. It was recognized that, due to the very tight timeline, there needed to be a way to by-pass the usual PAGES funding proposal deadline restraints. It was proposed to set up a fast-track funding process where the proposal must clearly state why it is a fast track application, and it should not be limited just to those aiming for IPCC inclusion.

It was reiterated that many 2k groups were already under very tight deadlines but that a number voiced their interest in providing additional products for IPCC and that these efforts should be supported. It was agreed that PAGES would communicate to the 2k community and other groups that PAGES is willing to offer a fast track workshop procedure under special circumstances.

Action **Offer “fast-track” support to 2k groups (as already outlined in 2k Network discussion, section 4)**

Action **IPO to set up webpage to complement the IPCC websites with compact IPCC relevant information tailored towards the paleoscience community**

A “skeptics” PPT presentation

Pierre outlined an idea for PAGES to develop a presentation that addressed specific scientific questions. The presentation could include examples of recent skeptic attacks and their scientific debunking, in

addition to information on how the IPCC process works. These presentations should be directed towards a scientifically minded audience.

It was agreed by the SSC that it would be good to have something official from PAGES but should come from a PAGES perspective, so that it lies within the boundaries of PAGES expertise. It was also highlighted that any presentation that was put online should be made available in a tamper-proof PDF format. The SSC also raised the possibility of providing a website that covers why certain situations in the past are different from what is happening now, and Anand suggested having a list of people from within the PAGES community that the media can contact with regard to specific questions.

Decision Pierre to start the process of preparing the presentation

11. SSC & EXCOM Membership

Thorsten summarized the upcoming changes to the PAGES SSC, in particular highlighting that at the end of next year Bette, Cathy and Mohammed will be rotating off, and that Claudio Latorre will be the only member from the Southern Hemisphere. Thus PAGES needs to target nominations that equalize gender and geography. In addition, the science of all Foci and CCT need to be represented. It was recognized that Focus 4 is currently under-represented on the SSC.

The SSC put forward a number of suggestions of potential SSC candidates and Thorsten mentioned that START is also likely to nominate people from Africa.

12. YSM and OSM

The next YSM and OSM (2013)

The SSC commented on the draft questionnaire to be sent out to any potential interested host. A number of specific changes were suggested for inclusion in the revised form. The SSC confirmed that the call for a host should be advertised as an open call.

Action IPO to make suggested changes to questionnaire

Action IPO to advertise an open call to host next OSM/YSM and send to pre-interested parties

13. The IPO

Visiting Scientist Program

The SSC briefly discussed the budget available to support guest scientists and how support was awarded. The SSC decided that the current process of application and support was working well and it would remain as is.