5th German PASADO Post-Drilling Workshop

October 10-12, 2011 in Erlangen

Participants:
Jean-Pierre Francois, Universität Köln (Chilean Ph.D. student)
Torsten Haberzetttl (only Tuesday), Universität Jena
Annette Hahn, Universität Bremen
Katja Hockun, MARUM, Universität Bremen
Andreas Lücke, Research Center Jülich
Julieta Massaferro, CONISET, Bariloche, Argentina
Christoph Mayr, Universität Erlangen/Nürnberg
Christian Ohlendorf, Universität Bremen
Frank Schäbitz, Universität Köln
Sebastian Wagner, GKSS Geesthacht
Stefan Wastegard (only Monday and Tuesday), University of Stockholm, Sweden
Michael Wille, Universität Köln
Jiayun Zhu, Research Centre Jülich
Bernd Zolitschka, Universität Bremen

Minutes:
Christoph Mayr & Bernd Zolitschka
Protokoll des 5. Deutschen PASADO Postdrilling Workshops

Timeschedule

Monday, October 10, 2011, starting at 13:00

13:00-13:30 Start of the workshop, introductory words
13:30-14:00 Jiayun Zhu: “The last Glacial–Interglacial transition in South Patagonia, Argentina, in stable isotope proxies of bulk sedimentary organic matter from Laguna Potrok Aike”
14:00-14:30 Sebastian Wagner: “South American blockings during the mid-Holocene and pre-industrial (historical) times”
14:30-15:00 Stefan Wastegard: “Tephrostratigraphy of the Laguna Potrok Aike sediment sequence and possible correlations with the southern Oceans and Antarctica”
15:00-15:30 Coffee Break
15:30-16:00 Michael Wille et al.: „The pollen record of the composite ICDP record“
16:00-16:30 Frank Schäbitz: “Paleoprecipitation values compared with the dust record during the last 50ka in southern Patagonia”
16:30-17:00 Jean-Pierre Francois: “New Holocene pollen records from the Southern Patagonian Channels”
19:00 Dinner at Kitzmann-Bräu

Tuesday, October 11, 2011, starting at 9:00am

09:00-10:30 Discussion of QSR manuscript: PASADO Chronology (Kliem et al.)
10:30-11:00 Coffee Break
11:00-13:00 Discussion of QSR manuscript: Precipitation reconstruction (Schäbitz et al.), Hydrological model (Ohlendorf et al.)
13:00-14:00 Lunch at Palmeria
14:00-15:00 Discussion of QSR manuscript: Stable isotope proxies (Zhu et al.)
15:00-15:30 Coffee Break
15:30-17:00 Discussion of QSR manuscripts: FTIRS results (Hahn et al.), Late Glacial (Jouve et al.), carbonate isotopes (Mayr et al. in prep.)
19:00 Dinner at Steinbach-Bräu

Wednesday, October 12, 2011

09:00-10:30 Discussion of QSR manuscripts: bioproxies (Massaferro et al.), Pollen (Wille et al.)
10:30-11:00 Coffee Break
11:00-13:00 Discussion of the two Laguna Chaltel manuscripts intended to be jointly submitted to the Journal of Paleolimnology: A) Ohlendorf et al.: Sedimentology and chronology, B) Bioproxies (diatoms, chironomids, ostracods, pollen)
13:00-14:00 Lunch at Palmeria
14:00-15:00 Discussion of QSR manuscript: Lake level (Kliem et al.) and carbonates (Oehlerich et al.)
15:00-16:00 Concluding discussion
Discussion of the chronology (V3)

After it became clear that there will be considerable changes with regard to the OSL ages obtained so far, discussions were starting about how to handle this new situation in terms of what will be published in the QSR special issue. After almost two weeks of discussion with PIs and other scientists via email this became also one of the main topics for this German PASADO workshop.

In the end we came to the agreement to leave the current age model V3 in action. This is available to everybody and already intensively used for the manuscripts dedicated to the upcoming QSR special issue which is due on October 31, 2011. This solution was guided by:

A) One of the major issues was that the latest interpretations of OSL dates were only sent to Catalina rather late, i.e. very shortly before the deadline for the QSR special issue (30.9. for internal review and 31.10. for submission). Therefore, Catalina was acting swiftly - with my consent and without me knowing the details just trusting the Danish OSL specialists and her interpretation. Looking back, this was too fast and perhaps not critical enough.

B) The main critical remarks that were discussed relate to:
1. The precision and quality of OSL dates in general.
2. The question whether OSL dates compete in quality of dating with radiocarbon (larger error margins, sometimes more than 10 cm sampling interval to obtain enough material for one dating).
3. The quality of correlation between site 1 and site 2, which is not too bad as was already clear from field-data when both records were linked via magnetic susceptibility. But this has not been convincingly discussed, yet.

C) Therefore, before OSL dates should be used for a new version of the age/depth model, all of these questions need to be answered. As many manuscripts are already written and relate to the radiocarbon chronology (age/depth model V3) which is well based and discussed, we will go with this \(^{14}\text{C}\) chronology for the upcoming QSR special issue because the discussion of a new chronological approach would delay publication by at least 6 months, if not more.

D) How to proceed:
1. There will be a methodological manuscript about the OSL dates for the QSR volume to give answers to above issue B1.
2. In a next step and not intended for publication in the PASADO QSR special issue, Catalina will detail on site correlation (B3) and compare OSL with the radiocarbon based chronology with a bunch of possible options (B2). The paper by Catalina Gebhardt et al. about the correlation of site 1 with site 2 intended for the QSR issue has been withdrawn. Catalina will combine this with the chronological issue.
3. After this manuscript is drafted, we will have to discuss about the next age/depth model (V4), a rather normal procedure for well-dated records (see ice cores as an example). It is always true that the more (dating) methods are being used, the more answers are obtained. As Flavio said: chronology is a running target!
4. After these steps have been taken, we have to discuss if a new age model beyond the one used in the QSR special issue should be used in the future.
With regard to those still working on SALSA sediment core material: They are advised to change from the SALSA age/depth model (Haberzettl et al., 2007) to the PASADO age/depth model V3 (Kliem et al., QSR special issue). An excel sheet to transform the SALSA sample depths to the V3 chronology is available on the ftp-server.

**Overview about currently running projects within the German Science Foundation Priority program “ICDP”**

**PASADO Support 2**

PASADO-Isotope (Research Centre Jülich, University of Munich):
- Ph.D. position at Research Centre Jülich: Jiayun Zhu about stable isotopes of organic matter until August 2013
- Ph.D. position at University of Munich (LMU): Markus Oehlerich about mineralogy of carbonates and stable isotopes of the carbonate fraction until October 2012.

**PASADO-Pollen (University of Cologne):** Postdoc position of Michael Wille about the pollen record of core catcher samples (and the PASADO composite sediment core) until March 2012

**PASADO Support 3**

POTROK-Eolian (University of Bremen, AWI Bremerhaven): grain size analysis and physical properties applied to the detection of dust in the sediment record until February 2012 – no position involved

PASADO-Lipids (MARUM-University of Bremen, AWI Bremerhaven): Katja Hockun about organic geochemistry (biomarker) and component-specific isotopic investigations of lipid biomarkers on surface samples (calibration) and sediment core samples aiming at quantitative reconstruction of temperature until September 2013 with the option of one additional year

**International collaboration**

**Argentina:** No news about the two groups in Diamante and Mar del Plata working on phytoliths. Paleomagnetic studies of the SALSA core are submitted to G³ (Gogorza et al.), rock magnetic studies are intended for the QSR special issue (Irurzun et al.). The rock and paleomagnetic studies of 5022-1CP are still ongoing. Chironomid studies on 5022-2CP are ongoing, those on the SALSA core will be published in the QSR special issue (Massaferro et al.).

**Canada:** Five manuscripts to all intended fields of study are going to be submitted to the QSR special issue (cf. list of contents below).

**Denmark:** OSL measurements using recently developed techniques on feldspar grains will be published in the QSR special issue (Buylaert et al.).

**Korea:** Beryllium-10 measurements on test samples from the SALSA core are submitted (Kim et al.). The publication in Quaternary Geochronology is still pending at the revision reviewing stage; the revised version was submitted in June. New data from the entire SALSA core will be provided soon.

**Sweden:** Detection and chemical characterisation of volcanic ash layers from the sediment core and terrestrial outcrops will be published in the QSR special issue (Wastegard et al.).
Switzerland: The manuscript about the core catcher samples is accepted with „The Holocene“ (Recasens et al., in press). Diatom studies on 5022-2CP are ongoing and studies of the SALSA core will be published in the QSR special issue (Massaferro et al.). Geomicrobiological analyses carried out on a PASADO gravity core are included in the QSR special issue (Vuillemin & Ariztegui), while another manuscript about Site 1D has been submitted to Geochimica Cosmochimica Acta (Vuillemin et al., subm.).

Related projects
Michael Wille: Palynological investigation of marine sediment cores offshore South America in the southern oceans has been submitted to the DFG (Normalverfahren) in cooperation with G. Kuhn (AWI Bremerhaven).
Laguna Chaltel: Manuscripts were discussed about a) lithology and chronology (lead author: C. Ohlendorf) and b) Bioproxies (pollen, diatoms, chironomids, ostracods; lead author: J. Massaferro) from the profundal cores of Laguna Chaltel to be published as joint papers in the Journal of Paleolimnology. Both presented interpretations of the same record fit favourably together. It was agreed to submit both manuscripts by the end of 2011.

Next meetings
- The next ICDP/IODP-Meeting of the DFG will take place at the University of Kiel on March 7-9, 2012. Perhaps we can organise the 6th German PASADO workshop before, on March 6/7, 2012 (starting on the 6th at 13h)?
- The next regular 6th or 7th German PASADO workshop will take place at the University of Cologne in August or September 2012 organised by Frank Schäbitz. The exact timing will be settled end of March 2012.
- Due to the lack of future funding there are currently no plans for a 4th International PASADO Workshop. Ideas to link such a workshop with any international conference for 2012 or later are appreciated.
- Bernd Zolitschka et al. intend to present a talk about the hydrological and lake level history of Laguna Potrok Aike at the 4th International Maar Conference (4IMC) in Auckland, New Zealand (February 20-24, 2012). This opportunity will also be used to present a poster by Catalina Gebhardt et al. about seismic data recently published in Gebhardt et al. (2011a, 2011b in press).

Publications
The following list of PASADO-related publications from 2011, in press or submitted is given for your information. All manuscripts in preparation or submitted for the QSR special issue are listed below separately.

Gogorza, C.S.G., M.A. Irurzun, A.M. Sinito, A. Lisé-Pronovost, G. St-Onge, T. Haberzettl, C. Ohlendorf, S. Kastner, B. Zolitschka (subm.). High-resolution paleomagnetic records from Laguna Potrok Aike (Patagonia, Argentina) for the last 16,000 years. Geochemistry, Geophysics, Geosystems.


Contents of the QSR special issue

The list of contents as of October, 24, 2011 is given for your information.

Guest-editors are: B. Zolitschka, P. Francus, N. Maidana, S. Wastegard & D. Ariztegui.

Manuscripts for this special issue are due October 31, 2011 (recently extended to November 30, 2011).

The following list of manuscripts (only the first author is given) is colour-coded with manuscripts submitted and available on the ftp-server (green), draft of manuscript available on the ftp-server (blue) and no draft received yet (black).

1) Zolitschka & all PIs: Scientific rationale to the Potrok Aike maar lake sediment archive drilling project (PASADO) - an introduction

2) Coronato: Glacial, fluvial and volcanic landscape evolution in the Laguna Potrok Aike maar area, Argentina
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(3) Ohlendorf: A comparison of hydrological balance calculations with instrumental lake level data for Laguna Potrok Aike (Argentina)

(4) Vuillemin: Geomicrobiological investigations of lake sediments over the last 1500 years

(5) Wastegard: Tephrostratigraphy of the Potrok Aike Maar Lake Sediment Sequence

(6) Kliem: Lithology, radiocarbon dating and sedimentological interpretation of the 51 ka BP lacustrine record from Laguna Potrok Aike, southern Patagonia

(7) Buylaert: Establishing a chronology for the PASADO 5022-1D core using feldspar infrared stimulated luminescence

(8) Oehlerich: Ikaite precipitation in a lacustrine environment in Patagonia (Argentina) – implications for paleoclimatic studies using carbonate isotopes from Laguna Potrok Aike

(9) Nuttin: Clay and early diagenetic (vivianite) minerals in the Laguna Potrok Aike sediment sequence

(10) Fortin: Density variability of the PASADO long composite record – method comparison and interpretation

(11) Jouve: Microsedimentological characterization using image analysis and XRF as indicators of hydrological changes during the Late Glacial at Laguna Potrok Aike, Santa Cruz, Argentina

(12) Hahn: Climate induced changes in the carbonate and organic content of Laguna Potrok Aike sediments during the past 50 ka inferred from infrared spectroscopy

(13) Lisé-Pronovost: High-resolution paleomagnetic secular variation and relative paleointensity since the Late Pleistocene in Southern South America

(14) Irurzun: Paleoclimatic variations during the Last 15,400 cal. BP detected by magnetic proxies of sediments from Laguna Potrok Aike (Patagonia, Argentina)

(15) Zhu: The last Glacial-Interglacial transition in Patagonia, Argentina, in stable isotope proxies of bulk sedimentary organic matter from Laguna Potrok Aike

(16) Schäbitz: Palaeoclimate reconstruction for Laguna Potrok Aike, southern Patagonia, based on pollen transfer functions

(17) Massaferro: Major lake level fluctuations and climate changes for the past 16,000 years as reflected by diatoms and chironomids preserved in the sediment of Laguna Potrok Aike, southern Patagonia

(18) Kliem, Mayr: Range and effects of lake level oscillations in the Patagonian steppe during the last 51,000 years, Laguna Potrok Aike (SE Argentina)

(19) Pollock: Atmospheric simulations of the present and past climate of southern South America

Help for finalising the manuscripts

On the PASADO homepage (http://www.pasado.uni-bremen.de) all manuscripts that are out or in press or submitted are available: http://www.pasado.uni-bremen.de/publications.html. Also available is a standard version of the acknowledgements (http://www.pasado.uni-bremen.de/acknowledgements.html) to be used as it is or in a modified version. Moreover, should you have the “PASADO science team” as a co-author, you may link it to the list of scientists as available on the ICDP website for PASADO: http://www.icdp-online.org/front_content.php?idcat=1494. A figure with the location of Laguna Potrok Aike in South America and a bathymetric map with drill sites indicated is available on the ftp-server (/array1/PASADO/Data/Maps/) as well as the list of manuscripts intended to be published in the QSR special issue (/array1/PASADO/Presentations/Publications). Please keep in mind, that for every manuscript the terms “Laguna Potrok Aike”, “PASADO” and/or “ICDP” should be listed at least in the title, the abstract and/or the keywords.