Newsletter January 2025

Dear PalMod members and friends,

happy new year and welcome to the first Newsletter of 2025.

In this issue you will find, besides the first draft of the agenda for the General Assembly (Point 1) and the usual list of milestones and deliverables (Point 4), some bad news to all colleagues who do the calculations on Levante at DKRZ (Point 2).

It is necessary to delete at least 1/3 of your data from /work <u>by the end of January</u> to be make sure, that everyone can continue working.

Moreover, we would like again to **announce the PalMod Special Issue** with the urgent request to name papers in preparation, which are suitable to be published there. We repeat the preliminary description of the Special Issue below (Point 3).

1. Preliminary Agenda for our General Assembly 16. / 17. 6. 2025 @MARUM

Please register when you plan to participate:
This is the <u>link</u> to the registration page: https://events.dkrz.de/event/75/

Mo. 16.06.2025

10:00 – 11:00	*Welcome Coffee*		60 min
11:00 – 12:50			**120 min**
	Welcome and Intro	Coordinators	15 min
	Housekeeping	K. Fieg	5 min

	REPORTING PalMod III		
	Overview CC 1,2,3		20 + 5 min
	Highlight Talk CC		15 + 5 min
	Overview WG3		20 + 5 min
	Highlight Talk WG3		15 + 5 min
	Discussion / Buffer		*10 min*
13:00 – 14:00	*Lunch*		
14:00 – 15:40	Cont. REPORTING PalMod III: WG2		100 min
	Overview WG2		20 + 5 min
	Highlight Talk WG2		15 + 5 min
	Overview WG1		20 + 5 min
	Highlight Talk WG1		15 + 5 min
	Discussion / buffer		*10 min*
15:40 – 16:10	*Coffee*		30 min
16:10 – 16:45	Introduction & Status to IOSC 2026		35 min
16:45 – 18:00	Poster Session Part 1		75 min
18:30 - xx	*Social Event @ tba*		

Tue, 17. 06.2025

9:00 – 10:00	Plenary discussion on IOSC (Structures, Topics and timeline)		60 Min
10:00 – 10:30	Coffee		
10:30 – 12:00	Poster Session Part 2		90 min
12:00 – 13:00	*Lunch*		
13:00 – 15:00	**The integrative perspective of PalMod**		120 min
	Reporting on the Status of the PalMod Special Issue		15 min
	Model intercomparison in PalMod		20 + 5 min
	The Antarctic Perspective		20 + 5 min
	Across models: fully coupled from 130 kybp to the future - reporting on the status		20 + 5 min
	tba		20 + 5 min
	Discussion / buffer		*5 min*
15:00 – 15:30	*Coffee*		
15:30 – 16:30	**Comments and Outlook**		60 min
	Comments from the SAB and PT		20 min
	Outlook / Final Discussion	All	40 min

The agenda is provisional and can be adapted, so all comments and suggestions for changes are welcome.
Moreover, I also ask everyone to volunteer for one of the presentations.

You will find the most updated version of the agenda on the PalMod web page (www.palmod.de).

2. DKRZ resources

As the Levante was heavily overbooked in the allocation round for 2025, all projects, including the PalMod consortium, had to accept significant reductions.

	Computing time [node-h]	/ work [TB]
We asked for	2.818.790	3.662,80
We got granted	882.753	1.926,00

While we can apply for additional computing time in Summer, the limits for /work must be met from End of January on!

In Detail:

	Status 07.01 (TB)	Share from 02/25 on (TB)	Difference (TB)
0989 (WG1 /WG3)	1555	1049	- 509
1030 (WG2)	1024	686	- 338
1192 (CC)	295	192	- 103

The data have to be deleted or moved to archive.

Please contact Daniel Heydebreck (heydebreck@dkrz.de) **well before** the end of January if you need help with moving your data to the archive.

3. PalMod Special Issue

To remind you: we are about to initialize a **PalMod related Copernicus Special Issue** across multiple Journals (which will be most likely *Climate of the Past, Earth System Dynamics, Science Data, Geoscientific Model Development*).

This is the preliminary description of the Special Issue:

Understanding past climate variability to enhance future climate-change projections

The period since the last interglacial featured a large range of climate variations. The range of of climate variations from the last interglacial, through the last glacial to the present provides opportunities to assess and improve comprehensive Earth system models. Models that can successfully simulate climate variations during the last glacial cycle, might enable us to more reliably assess future climate changes. More specifically, models tested against the paleoclimate record can inform, for example, about a regime shift in climate variability or the occurrence of abrupt events during the next centuries and millennia in response to global warming. Examples of other pressing questions are: could polar ice sheets collapse catastrophically and how

quickly can sea level rise under present and future climate conditions? Or, what is the fate of permafrost in a warming world?

In this framework we invite contributions on the following topics:

- Improvement of Earth-system models to more reliably project future climate over the next centuries and millennia
- Multicentennial-to-multimillennial transient climate simulations with comprehensive Earth-system models for the past and future
- Proxy-data systhesis for the time period since the last inglacial to assess Earth-system models
- Assessing climate stability and feedback mechanism (including climate-carbon cycle interaction) since the last interglacial by means of comprehensive Earth-system models

What will happen next?

We will form a team of editors and co-editors. The editorial team will call for expressions of interest (planned articles within relevant fields, targeted journals, and anticipated submission dates) in the time window roughly between February 2025 and December 2025.

If you plan to submit a paper in one of the journals mentioned above, please contact me (kfieg@geomar.de), I will start collecting the potential contributions – this is essential to continue with the planning.

Also contact me (kfieg@geomar.de), if you are interested to take over the tasks of a co-editor.

4. M&D of PalMod Phase III due until 03/25

WG2	M2.1.8	9	01.03.24	MPI (TP3)	PalMod versions of JSBACH in MPI-ESM and AWI-ESM is updated with existing permafrost carbon module.
WG2	M2.2.4	12	01.06.24	MPI	Transient deglaciation simulations with different climate and ocean physics parameters or different ice sheet reconstruction.
WG2	M2.2.7	12	01.06.24	MPI	Ensemble simulations with perturbed initial conditions for abrupt events (Heinrich events, Bølling–Allerød warming, or Younger Dryas).
WG2	M2.2.11	12	01.06.24	MARUM	transient simulation of Heinrich stadial 1 as part of the simulation of the full last deglaciation (~21 ka BP to ~8 ka BP) with iCESM and dynamic ice sheets in WP1.1.
WG2	M2.1.4	15	01.09.24	MPI, AWI (TP2)	Standardised setup of terrestrial C cycle and methane cycle distributed to PalMod users of MPI-ESM
WG2	M2.2.1	15	01.09.24	AWI	Deglaciation experiments for the investigation of the effect of saltiness of the deep ocean.
WG3	M3.1.2	15	01.09.24	Uni Bonn	Implementation of the model and applications on PalMod's curated pollen data compilations and climate reconstructions. Compilation and standardisation of the results following the DMP created during Phase II. Inclusion of data and method in PTBox.
WG3	D3.1.2	15	01.09.24	Uni Bonn	Mapping of the propagation of rapid climatic changes in different regions (e.g. North America, Europe, Asia) to identify leads and lags on land during abrupt events of the last glacial cycle (Glacial Inception, MIS3, Deglaciation). Model- data comparison to constrain large-scale patterns of climate change.
WG3	M3.3.3	15	01.09.24	Uni Tübingen	Model-based patchwork spectrum for temperature from daily to Glacial/Interglacial scales created and compared to forcing.
CC	DCC2.2	18	01.12.24	MARUM	Upload of harmonized proxy data exported from PaleoDataView to PANGAEA
WG2	D2.1.2	18	01.12.24	MPI, AWI (TP2)	Simulated and reconstructed quantitative forest cover and comparison methods are handed over to the PTBox
WG2	M2.2.9	18	01.12.24	CAU	Transient CLIMBER-X deglaciation simulations with sinking schemes of varying complexity (Martin-type sinking, ballasting alone, viscosity effects, M4AGO-type aggregate size distribution and microstructure).
WG3	M3.3.1	18	01.12.24	AWI	Merging of regional δ18O and temperature variability estimates across domains (marine, terrestrial and ice) finished.
WG3	M3.1.3	20	01.02.25	MARUM, Uni Bonn	Probabilistic assessment of the dynamics of land- ocean linkages since the last termination in data and models and lessons for future climate and ecosystems.
WG3	D3.1.3	20	01.02.25	MARUM, Uni Bonn	Assessment of the dynamics of land-ocean linkages since the last termination and deliver constraints from the past response of the climate and ecosystem for future projections.

All documentation on M or D can be found here:
https://www.palmod.de/group/palmod/palmod-iii-milestones-deliverables

Green = relax / Orange = overdue / Red = significantly overdue

5. Summary of PalMod Paper from 2024

Between 2016 and 2024, **262** scientific publications were realized directly through PalMod Funding. Please contact me, if you miss your / a paper.

Willeit, M. and Ganopolski, A.: Generalized stability landscape of the Atlantic meridional overturning circulation, Earth Syst. Dynam., 15, 1417–1434, https://doi.org/10.5194/esd-15-1417-2024, 2024.

Zeller, M. and **Martin, T.** (2024) *On warm bias and mesoscale dynamics setting the Southern Ocean large-scale circulation mean state.* Ocean Modelling, 191 DOI 10.1016/j.ocemod.2024.102426.

Albrecht, T., Bagge, M. and **Klemann, V**. (2024) *Feedback mechanisms controlling Antarctic glacial-cycle dynamics simulated with a coupled ice sheet–solid Earth model.* The Cryosphere, 18 (9). pp. 4233-4255. DOI 10.5194/tc-18-4233-2024.

Schindlbeck-Belo, J. C. , Toohey, M., Jegen, M. , Kutterolf, S. and **Rehfeld, K.** (2024) *PalVol v1: a proxy-based semi-stochastic ensemble reconstruction of volcanic stratospheric sulfur injection for the last glacial cycle (140 000–50 BP).* Earth System Science Data, 16 . pp. 1063-1081. DOI 10.5194/essd-16-1063-2024.

Höning, D., **Willeit, M.** and **Ganopolski, A.** (2024) *Reversibility of Greenland ice sheet mass loss under artificial carbon dioxide removal scenarios.* Environmental Research Letters, 19 (2). Art.Nr. 024038. DOI 10.1088/1748-9326/ad2129.

Wunderling, N., von der Heydt, A. S., Aksenov, Y., Barker, S., Bastiaansen, R., **Brovkin, V.,** Brunetti, M., Couplet, V., **Kleinen, T.,** Lear, C. H., Lohmann, J., Roman-Cuesta, R. M., Sinet, S., Swingedouw, D., **Winkelmann, R.,** Anand, P., Barichivich, J., Bathiany, S., Baudena, M., Bruun, J. T., Chiessi, C. M., Coxall, H. K., Docquier, D., Donges, J. F., Falkena, S. K. J., Klose, A. K., Obura, D., Rocha, J., Rynders, S., Steinert, N. J. and **Willeit, M**. (2024) *Climate tipping point interactions and cascades: a review.* Earth System Dynamics, 15 (1). pp. 41-74. DOI 10.5194/esd-15-41-2024.

Ackermann, L., T. Rackow,**Himstedt, K.,** Gierz, P.**, Knorr, G., and Lohmann , G.:** A comprehensive Earth system model (AWI-ESM2.1) with interactive icebergs: effects on surface and deep-ocean characteristics. GMD, 17, 3279–3301, 2024. https://gmd.copernicus.org/articles/17/3279/2024/

Blanchet, C.L., **Ramisch, A, Tjallingii, R., Ionita M.**, Laruelle, L., **Bagge, M., Klemann, V.. Brauer, A.**: Climatic pacing of extreme Nile floods during the North African Humid Period. Nat. Geosci. 17, 638–644 (2024). https://doi.org/10.1038/s41561-024-01471-9

M. Willeit, R. Calov, S. Talento, R. Greve, J. Bernales, **V. Klemann, M. Bagge, and A. Ganopolski.** (2024). Glacial inception through rapid ice area increase driven by albedo and vegetation feedbacks. Clim. Past, 20, 597–623, 2024. https://doi.org/10.5194/cp-20-597-2024

Eicker, A., Schawohl, L., Middendorf, K., **Bagge, M.**, Jensen, L., & Dobslaw, H. (2024). Influence of GIA uncertainty on climate model evaluation with GRACE/ GRACE-FO satellite gravimetry data. Journal of Geophysical Research: Solid Earth, 129, e2023JB027769. https://doi.org/10.1029/2023JB027769

Schannwell, C., Mikolajewicz, U., Kapsch, M.-L., Ziemen, F. (2024). A mechanism for reconciling the synchronisation of Heinrich events and Dansgaard-Oeschger cycles. Nature Communications 15, 2961, https://doi.org/10.1038/s41467-024-47141-7

Weitzel, N., Andres, H., Baudouin, J.-P., Kapsch, M.-L., Mikolajewicz, U., Jonkers, L., Bothe, O., Ziegler, E., Kleinen, T., Paul, A., and Rehfeld, K.: Towards spatio-temporal comparison of simulated and reconstructed sea surface temperatures for the last deglaciation, Clim. Past, 20, 865–890, https://doi.org/10.5194/cp-20-865-2024.

Meister, P., Alexandre, A., Bailey, H., Barker, P., Biskaborn, B.K., Broadman, E., Cartier, R., Chapligin, B., Couapel, M., Dean, J.R., Diekmann, B., Harding, P., Henderson, A.C.G., Hernandez, A., **Herzschuh, U.**, Kostrova, S.S., Lacey, J., Leng, M. J., Lücke, A., Mackay, A.W., Magyari, E. K., Narancic, B., Porchier, C., Rosqvist, G., Shemesh, A., Sonzogni, C., Swann, G.E.A., Sylvestre, F., and **Meyer, H.** (2024). A global compilation of diatom silica oxygen isotope records from lake sediment – trends, and implications for climate reconstruction. Climate of the Past (cp-2022-96). https://doi.org/10.5194/cp-20-363-2024

Köhler, P. and Mulitza, S.: No detectable influence of the carbonate ion effect on changes in stable carbon isotope ratios (δ13C) of shallow dwelling planktic foraminifera over the past 160 kyr, Clim. Past, 20, 991–1015, https://doi.org/10.5194/cp-20-991-2024

Niu, L., Knorr, G., Krebs-Kanzow, U. et al. Rapid Laurentide Ice Sheet growth preceding the Last Glacial Maximum due to summer snowfall. Nat. Geosci. https://doi.org/10.1038/s41561-024-01419-z

Butzin, M., **Ye, Y., Völker, C.**, Gürses, Ö., Hauck, J., and **Köhler, P.**: Carbon isotopes in the marine biogeochemistry model FESOM2.1-REcoM3, Geosci. Model Dev., 17, 1709–1727, https://doi.org/10.5194/gmd-17-1709-2024