



[pastglobalchanges.org/2k](http://pastglobalchanges.org/2k)

Dear colleagues,

We hope this circular finds you safe and well. In this circular, you will find updates about the 4th phase of the 2k Network, the PAGES 2k Network sponsored EGU session, and information on a PAGES Topical Science Meeting (TSM) that we will co-host with Climate Variability Across Scales ([CVAS](#)) working group in **March 2023**.

This circular is sent to all 2k mailing list subscribers. Feel free to forward it to interested colleagues with a link to the [PAGES 2k list](#) where they can sign up to receive future circulars. You can unsubscribe at any time [here](#). All previous circulars are available online on the [PAGES 2k Network](#) website.

Best wishes from the 2k Phase 4 coordinators:

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## 1 – PAGES 2k Network Phase 4 updates

As detailed in the [previous 2k circular](#), the objectives for this phase are as follows:

1. Reconstruct spatial and temporal hydroclimate variability and change over the Common Era from local to global scales.
2. Evaluate and constrain Earth system models using hydroclimate proxy data, whilst using models to inform process-level understanding of Common Era hydroclimate.
3. Develop tools and practices to maximize interoperability of 2k data products, including data sets from earlier phases.
4. Translate the science into evidence-based policy outcomes.

Since January, we have focused on plans to address and communicate Phase 4 objectives.

To address Objective 1, we have created an exhaustive list of hydroclimate-relevant paleoclimate proxies. This exercise started the process of understanding which proxies, time resolution (annual or longer scale), metadata information (e.g. seasonality) and interpretations (e.g. temperature, hydroclimate, environmental) will be most relevant for a large-scale paleo-hydroclimate synthesis. We are initially focusing on data that are already available in databases (e.g. 2k databases, SISAL), as this leverages the key strengths of the 2k Network which is to create products and information from multi-archive, multi-proxy datasets.

Based on internal discussions, we are initially targeting hydroclimatic variability in three regions: North Atlantic region, the Indo-Pacific region, and the mid-to-high Southern latitudes. Targeted discussions for how to go about reconstructing hydroclimate in these regions are underway. In-line with Objective 4, reconstruction of policy relevant hydroclimate parameters, processes and information are a priority target through the discussions. We have also communicated these evolving plans at multiple conferences: EGU22, PAGES-OSM and the future conferences of AGU22 and INQUA23, actively inviting collaborations.

At this time, we warmly invite you to submit abstracts to the 2k sponsored session at EGU23: 'Studying the climate of the last two millennia'

<https://meetingorganizer.copernicus.org/EGU23/session/45524>

Please send us an email if these 2k Network activities are of interest to you and fit into your ongoing work (pages2kcoordinators@gmail.com). Also see the hybrid meeting opportunity detailed below.

## 2 – Topical Science Meeting

The PAGES 2k Network and Climate Variability Across Scales (CVAS) working groups are jointly organizing a PAGES-funded Topical Science Meeting '**Centennial climate variability at regional scale in models and reconstructions**'. This meeting will be held in a hybrid format based at Potsdam, Germany from **8-10 March 2023**. This TSM has a joint objective as outlined below:

Clear progress has been made in improving the agreement between model results and global reconstructions at decadal and longer timescales over the Holocene. This can be attributed, at least in part, to the development of new reconstructions by PAGES working groups. However, current climate models still strongly underestimate the magnitude of regional variability at centennial time scales compared to proxies, which have their own limitations as non-climatic processes or data processing can influence the way they represent centennial variability.

PAGES 2k and CVAS provide complementary views on centennial variability. CVAS provides a broad view of variability at all timescales, while the 2k Network concentrates on the past two

millennia. This period is well suited to study centennial variability, with ample proxy networks and a good understanding of how external forcings have driven the global climate. However, most existing studies have concentrated on annually-resolved records, which are often too short to quantify centennial variability. Both groups also used complementary methods, PAGES 2k focused on methods allowing for an optimal reconstruction of time-series; whereas CVAS more focused on preserving the full spectrum of climate variability.

PAGES 2k and CVAS have collaborated in the past, but having a specific joint workshop is a great opportunity to strengthen the links, exchange methodologies and offer new ways to understand the processes at the origin of centennial variability and the reasons for the model-data disagreements.

If this subject is of interest to you, you can see further details on the PAGES calendar: <https://pastglobalchanges.org/calendar/134682>. Please fill the 'expression of interest form' latest **by 10 December 2022** if you would like to participate in the workshop: [https://docs.google.com/forms/d/e/1FAIpQLSfTZ1rqXlqI8Yo7K6GHvib\\_zulattHfLzu0Y2mZyKN-F8NQ6A/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSfTZ1rqXlqI8Yo7K6GHvib_zulattHfLzu0Y2mZyKN-F8NQ6A/viewform?usp=sf_link). Expressions of interest from those researchers whose work aligns with the workshop objectives will be invited to participate in the workshop. Limited funding is available to support attendance of ECRs and scientists working in low-mid-income countries.

### **3 – Upcoming PAGES 2k events**

The Topical Science Meeting described above will include a two-day workshop specifically for the 2k Network, the aim of which will be to build on previous work to finalize a definition of what a new hydroclimate database/reconstruction should look like, as well as a framework for database construction and use, timelines and responsibilities. This meeting will be held in the same location as the TSM on the 6-7th March 2023.

Hydroclimate is more variable than temperature in terms of spatial variability, variability across scales, parameters (e.g. precipitation rainfall amount, P/E, statistics of extremes etc.), hence providing additional reconstruction challenges. We plan to focus our initial investigation on specific regions where hydroclimatic variability is dominated by one of three major climate modes: North Atlantic Oscillation, El Nino Southern Oscillation [including monsoon regions], and Southern Annular Mode. Therefore our objectives for this first workshop of 2k Network Phase 4 are as follows

- Bring together researchers with expertise in different hydroclimate-relevant proxies and different regions to define target hydroclimate variables to reconstruct. 2k Network has created a list of proxies and the hydroclimate/environmental parameters that can be reconstructed from them. This workshop would facilitate discussions on their scope.

- Isolate the key gaps in our understanding of Common Era hydroclimatic variability that can be addressed using data synthesis and data-model comparison approaches. There will be additional brainstorming around the uses of a hydroclimate database for ongoing, planned and future research projects to ensure that the data and metadata fields will be useful for multiple different types of investigations.
- Discuss the feasibility of producing datasets for model evaluation. To find a common ground, we aim to have a conversation about what variables can be reconstructed and what variables are useful for model evaluation or assimilation into reanalyses. This objective fits particularly well given the Topical Science Meeting with the CVAS group which immediately follows this 2k workshop.

The outcome of this workshop is to have the definition of what a new hydroclimate database would look like, a framework for database construction and use, timelines and responsibilities.

As listed for the TSM above, if this subject is of interest to you, you can see further details on the PAGES calendar: <https://pastglobalchanges.org/calendar/134682>. Please fill the 'expression of interest form' at the latest **by 10 December 2022** if you would like to participate in the workshop:

[https://docs.google.com/forms/d/e/1FAIpQLSfTZ1rqXlql8Yo7K6GHvib\\_zulattHfLzu0Y2mZyKN-F8NQ6A/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSfTZ1rqXlql8Yo7K6GHvib_zulattHfLzu0Y2mZyKN-F8NQ6A/viewform?usp=sf_link). Expressions of interest from those researchers whose work aligns with the workshop objectives will be invited to participate in the workshop. Limited funding is available to support attendance of ECRs and scientists working in low-mid-income countries. **Note: the same form is to be filled for participation in the 2k + CVAS TSM and the 2k-only workshop options. Please select the appropriate option in the online form.**

More upcoming meetings can be found at: [pastglobalchanges.org/calendar](https://pastglobalchanges.org/calendar).

Thank you!  
Best wishes  
2k Phase 4 coordinators