

## Background

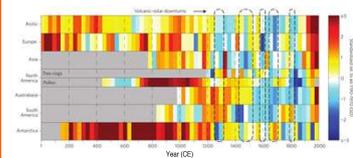
The **past 2000 years** (the "2k" interval) provides critical context for understanding recent anthropogenic forcing of the climate and includes baseline information about the characteristics of **natural** climate variability. It also presents opportunities to improve the interpretation of **proxy observations**, and to evaluate climate models used to make future projections.

In 2008 PAGES initiated the 2k Network to coordinate and integrate regional efforts to assemble **proxy observations** and generate climate **reconstructions**. Nine **regional groups** were established during the course of the initiative, spanning eight **continents** and the **global ocean**.

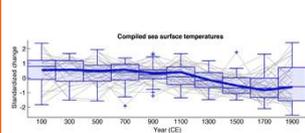
**Phase 1** (2008-2013) focused on generating regional **temperature reconstructions** [Figure 1]. During **Phase 2** (2014-2016), a number of **trans-regional groups** emerged from amongst the community, focusing on topical challenges such as **methods development**, **data-model comparison**, **database construction** and **large-scale climate** [Figures 2-5].

## Toward Phase 3 trans-regional projects

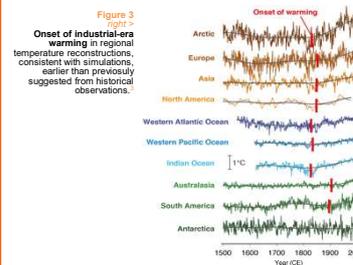
The PAGES 2k initiative spawned network-wide projects during **Phases 1 and 2** providing the inspiration for **Phase 3** development.



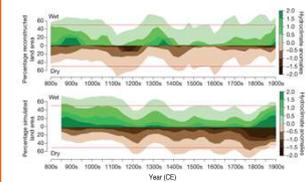
**Figure 1** < left >  
The regional nature of the Medieval Warm Period and the Little Ice Age observed in multidecadally averaged standardized temperature anomalies across the seven PAGES 2k Network regions.



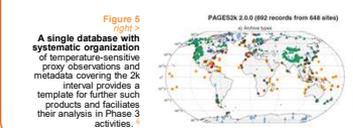
**Figure 2** < left >  
Global cooling over the pre-anthropogenic past millennium is consistent with simulations suggesting it was forced by clusters of volcanic events, reversed within the industrial era.



**Figure 3** < right >  
Onset of industrial-era warming in regional temperature reconstructions, consistent with simulations, earlier than previously suggested from historical observations.



**Figure 4** < left >  
Spatially resolved reconstructions and simulations of precipitation across the Northern Hemisphere for the past 1200 years are not in agreement, suggesting further investigation of the potential for systematic errors in each.



**Figure 5** < right >  
A single database with systematic organization of temperature-sensitive proxy observations and metadata covering the 2k interval provides a template for further such products and facilitates their analysis in Phase 3 activities.

## Our vision for Phase 3: Themes and activities

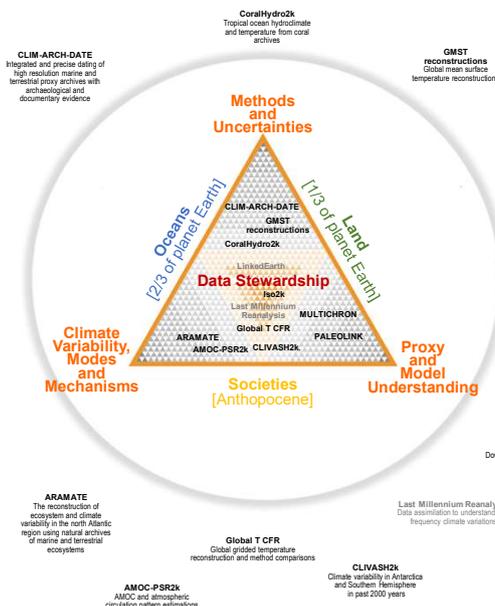
**PAGES 2k Phase 3** (2017-2020) was launched in **May 2017**. Goals of **Phase 3** are organised under **three Themes** and **one integrative activity** (ia) [Figure 6]:

**Methods and Uncertainties**  
Reduce uncertainties in the interpretation of observations imprinted in paleoclimatic archives by environmental sensors

**Proxy and Model Understanding**  
Identify and analyse the extent of agreement between reconstructions and climate model simulations

**Climate Variability, Modes and Mechanisms**  
Further understand the mechanisms driving regional climate variability and change on interannual-to-centennial time scales

(ia) **Data Stewardship** Assemble and curate observations, simulations and metadata essential for replication and future studies



**Figure 6** The 2k Network universe **Phase 3**. Key aspects of all **PAGES 2k projects** are end-to-end workflow transparency, open data, and knowledge access.

## References

- PAGES 2k Consortium, 2013:** Continental-scale temperature variability during the past two millennia. *Nature Geoscience*, 6, 339-346.
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- Abram, N.J., McGregor, H.V., Tierney, J.E., Evans, M.N., McKay, N.P., Kaufman, D.S., and PAGES 2k Consortium, 2016:** Early Onset of Industrial-Era Warming across the Oceans and Continents. *Nature*, 536, 411-18.
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## Call for Participation

### The 2k Network needs you!

Following the spirit of **Phases 1 and 2**, the **2k Network** is **inclusive** and open to anyone who is interested. Members from related communities are **warmly welcomed to join** or even **initiate 2k projects**. There are many ways to be part of the **PAGES 2k community**.

> **Contribute** to the ongoing **database and knowledge-base efforts** with **your data and expertise**

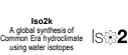
> **Initiate** a new **2k project**

**New 2k projects can be proposed at any time** at <http://www.pastglobalchanges.org/ini/wg/2k-network/projects>

> **Participate** in an emerging **2k project**, by contributing towards project coordination, data analysis, interpretation or writing

If you would like to participate in **Phase 3** of the **PAGES 2k Network** or receive updates, please **join** our mailing list <http://www.pastglobalchanges.org/ini/wg/2k-network/intr> or speak to a **Coordinating Committee member**.

## 2k Network Coordinating Committee



## Phase 3 Structure

Research is organised as a linked network of **well-defined projects** and **targeted manuscripts**, identified and led by **2k members**. This bottom-up concept of **projects** initiated and conducted by community members will further stimulate **collaboration** during **Phase 3** of the **2k Network**.

**PAGES 2k projects** focus on **specific scientific questions** aligned with **Phase 3 Themes**, rather than being defined along regional boundaries. An enduring element from earlier phases is a **culture of collegiality, transparency, and reciprocity**. **Phase 3** seeks to stimulate **community-based projects** and facilitate **collaborations** between researchers from **different regions and career stages**, drawing on the breadth, depth, broad expertise and input of the **global PAGES 2k community**.

All **PAGES 2k projects** also promote **best practises** in **Data Stewardship** for the research community.

**Phase 3** seek to further develop **collaborations** with other research communities and **engage with stakeholders** at the project and network level through interaction with related institutions and initiatives such as **Future Earth, WCRP, IPCC and EarthCube**.