

PAGES 2k PROXY DATABASE

A comprehensive database of proxy climate data is essential to develop a global view of climate change over the past 2000 years. Ready access to a large volume of information in a coherent, logical and flexible format will accelerate discovery in climate science. The [PAGES 2k](#) database is envisioned as a comprehensive information library from which researchers can address a broad variety of scientific questions. Because including every published proxy climate record is impractical, guidelines are needed to identify records that are most relevant to understanding climate evolution over the last 2000 years, while at the same time are not too restrictive as to impose a selection bias. The goal is to develop a uniform worldwide database by including a comprehensive collection of all published proxy records that meet relatively broad criteria, not only those that are currently discoverable through online archives, or that are used for a particular analysis or that meet more strict criteria. The PAGES 2k database is designed to facilitate model-data comparisons. It contains all proxy data and metadata in a standardized and machine-readable format. And, it includes fields needed to convey information about the interpretation and best use of each dataset

The PAGES 2k project is open to all interested scientists; anyone who knows of a proxy climate record that meets the criteria and is not already in the database can work with his/her regional data manager to add it. PAGES 2k leaders make an effort to engage project participants who help assemble datasets as coauthors of data- and research-oriented publications that are based on the data compilation. Contact your [regional data manager](#), [group leaders](#) or the [2k Network Coordinators](#), or download the [existing PAGES 2k database](#).

Selection Criteria

(1) Relation between proxy value and climate

Many proxy records have been transformed to specific climate variables; others that have not been transformed are nonetheless valuable for understanding the timing and often the magnitude of climate change. **The relation between the proxy indicator and one or more climate variables must be stated in a peer-reviewed publication.**

(2) Record duration

A primary goal of the PAGES 2k project is to understand climate forcing over the entire Common Era. Records of this duration are most commonly accessible from non-annually resolved, terrestrial archives; a minimum length of **500 years** for these records serves as a coarse initial screen. For annually banded terrestrial records (e.g. varves, glacier ice, tree rings), shorter-duration records that overlap the instrumental period are useful for calibration-validation and for bridging between annually-resolved and lower-resolution records. Annually resolved records from terrestrial archives must be at least **300 years** long. Annually resolved records from marine archives are rarely this long, but provide critical information where instrumental data are often sparse or absent. These records must be at least **50 years** long.

(3) Chronological accuracy

A large proportion of Quaternary proxy records span many millennia and have chronologies that are too uncertain for PAGES 2k paleoclimate syntheses. Recognizing, however, that natural archives can accumulate at steady rates at some sites and considering the goal of building a comprehensive database from which records can be culled as necessary, depending on the scientific question, the initial screen for chronological control is relatively coarse. Once candidate records have been discovered, their age-model uncertainty can be quantified using existing statistical procedures that provide a more useful basis for culling or weighting individual records. Namely, when annual layers cannot be counted, the timeline must be constrained by **at least one chronological control point near the end (most recent) part of the record and another near the oldest part of the record, or 1 AD, whichever is younger. Records that are longer than 1000 years must include at least one additional age nearly midway between the other two.** What constitutes "near" is open to reasonable interpretation. **Most importantly, the raw chronological data must be included in the database** so that age uncertainty associated with curve fitting and radiocarbon calibration can be modeled and quantified.

(4) Record resolution

PAGES 2k scientific questions focus on centennial and finer time scales. Appropriate records are resolved with **at least one analysis every 50 years** on average. Such records are rare from marine sediment, for which **200 years** is the minimum average sample interval. Lower-resolution records might also be appropriate to include for some proxy types, such as from boreholes.

(5) Availability

Proxy records used in PAGES 2k synthesis products are publically available and trackable with proper citation. As such, **records must be included in a peer-reviewed publication**, or a manuscript describing and including the data must be submitted by the time they are used in a synthesis. Datasets can be tracked and cited using DOIs or other unique identifiers available through data-oriented publications and international data repositories.

Summary of criteria for proxy records included in the PAGES 2k database

		Annually banded		Non-annually banded	
		Terrestrial	Marine	Terrestrial	Marine
Record duration	Minimum during the past 2 kyr:	300 yr	50 yr	500 yr	500 yr
Resolution	Average of at least one analysis every:	≤ 50 yr	≤ 50 yr	≤ 50 yr	≤ 200 yr
Relation between proxy value and climate	Either quantitative or qualitative	Described in a peer-reviewed publication			
Chronological accuracy		Cross-dated or layer counted		At least one control point near the end (most recent) part of the record and one near the oldest part, or 1 AD, whichever is younger. Records >1ka must include min. 1 additional age midway between the other two.	

Note:

Event (non-continuous) indicators of climate (e.g. middens, moraines, shorelines, dunes) are treated separately from the time-series data