

# PAGES 2k data portal and the LiPDverse

Darrell Kaufman<sup>1</sup>, J. Hunter<sup>2</sup> and N. McKay<sup>1</sup>

**PAGES Data Stewardship project creates a one-stop-shop for PAGES 2k Network data products, while LiPDverse complements with additional analysis-ready datasets.**

Data compilations generated by PAGES working groups are used in major science-synthesis products that address high-level global-change research topics. These data products are highly curated and extensively analyzed, with outcomes that are applied in a variety of contexts, including model-data comparisons. Such data compilations are valuable as snapshots of the data available at the time they were assembled. They typically include rich metadata for intelligent reuse and thereby can be merged with an ever-growing collection of paleodata. This pool of paleodata is valuable as it can be searched and analyzed with the intent of addressing new scientific research questions that go beyond an individual dataset. This complementary connection between individual data products and the collective aggregate of datasets is exemplified by the new PAGES 2k Network data portal, which gathers major data products from the PAGES 2k Network ([pastglobalchanges.org/2k](https://pastglobalchanges.org/2k)), and the LiPDverse, a data service for datasets built in the PaleoData (LiPD) framework (McKay and Emile-Geay 2016), which includes most PAGES 2k products (Fig. 1).

## PAGES 2k data portal

The new PAGES 2k data portal ([pastglobalchanges.org/science/wg/2k-network/database-map](https://pastglobalchanges.org/science/wg/2k-network/database-map)) describes each of the major data products and reconstructions that have been generated by the PAGES 2k Network over the past decade. Data products are organized according to their primary paleodata type and, where applicable, by regions. The portal summarizes the origin and purpose of each data product. It describes the data and metadata contents, and provides links for accessing the

datasets and their corresponding publications. A mapping tool provides access to individual datasets within each product. This new platform advances PAGES' commitment to advancing FAIR data principles (PAGES Scientific Steering Committee 2018). It also provided an opportunity for its primary creator—PAGES data steward and early-career scientist, Jasmine Hunter (University of Wollongong, Australia)—to advance her coding and data management skills, while expanding her professional network globally.

## LiPDverse

PAGES 2k data products are highly complementary with ongoing projects through LinkedEarth ([linked.earth](https://linked.earth)), including the LiPDverse ([lipdverse.org](https://lipdverse.org)). Many current and forthcoming PAGES 2k projects have curated their datasets in the metadata-rich and machine-readable LiPD framework. These products are available through the LiPDverse, a website where users can find, view, and download PAGES 2k and other paleodata compilations, or search for a subset of records within compilations. LiPDverse is an entry point to the LiPD "ecosystem" of analysis and visualization tools, including *geoChronR*, *pyleo*, and the forthcoming abrupt change toolkit in R (*actR*). Tools are available, and more are in development, for accessing LiPD-formatted data in R and python. These tools interact with datasets from both LiPDverse and from the Neotoma Paleocology Database ([neotomadb.org](https://neotomadb.org)), with the goal of streamlining data discovery and analysis, and increasing reproducibility. A recent example based on West Africa paleoclimate records highlights how data from different sources can be assembled,

and visualized (McKay et al. 2022; [earthcube2022.github.io/ec22\\_mckay\\_etal](https://earthcube2022.github.io/ec22_mckay_etal)). Online tutorials are available to explain how LiPD tools can be applied to PAGES 2k data products, including Arctic2k ([nickmckay.github.io/GeoChronR/articles/PCA.html](https://nickmckay.github.io/GeoChronR/articles/PCA.html)) and Iso2k ([nickmckay.github.io/GeoChronR/articles/tidyIso2k.html](https://nickmckay.github.io/GeoChronR/articles/tidyIso2k.html)).

## PAGES Data Stewardship Scholarship

The PAGES 2k Network was among the inaugural group of 11 Data Stewardship Scholarships awarded in 2021 (Kaufman 2022). The PAGES 2k data portal is an outcome of the project. PAGES Data Stewardship Scholarships recognize and reward PAGES working groups for their valued efforts to compile and curate data products for the long-term benefit of the global paleoscience community. Any member of a PAGES working group can apply for a Data Stewardship Scholarship; contact your working group leaders. For more information, see the PAGES website: [pastglobalchanges.org/science/wg/data-stewardship-scholarship](https://pastglobalchanges.org/science/wg/data-stewardship-scholarship)

## AFFILIATIONS

<sup>1</sup>School of Earth and Sustainability, Northern Arizona University, Flagstaff, USA

<sup>2</sup>School of Earth, Atmosphere and Life Sciences, University of Wollongong, Australia

## CONTACT

Darrell Kaufman: [Darrell.Kaufman@nau.edu](mailto:Darrell.Kaufman@nau.edu)

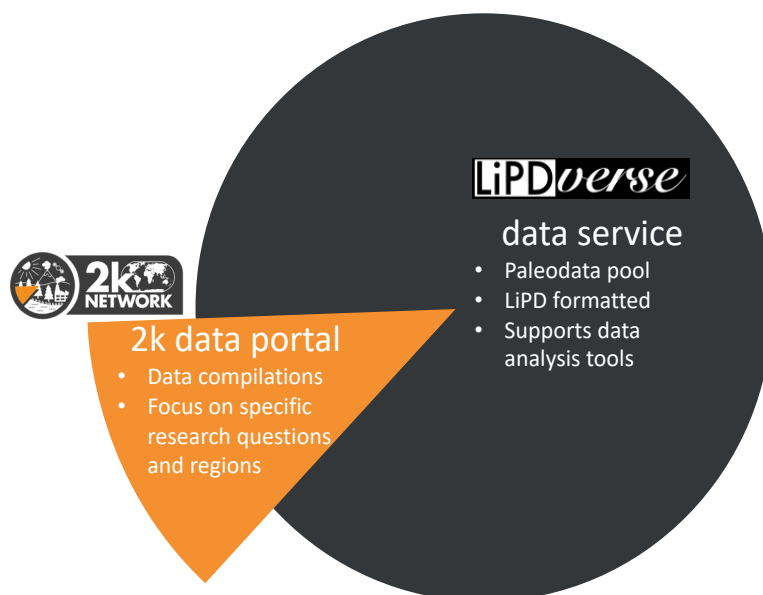
## REFERENCES

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**Figure 1:** Complementary connection between the new PAGES 2k Network data portal, which gathers major data products from the PAGES 2k Network, and the LiPDverse, a data service for datasets built in the PaleoData (LiPD) framework, which includes most PAGES 2k products.