

The PAGES Data Stewardship Integrative Activity seeks to advance best practices for sharing data generated and assembled as part of all PAGES-related activities. As part of this activity, a team of reviewers has been constituted for the “Climate of the Past 2000 years” Special Issue. The data team is reviewing the data handling within each of the CP-Discussion papers in relation to the CP data policy and current best practices. The team has identified essential and recommended additions for each paper, with the goal of achieving a high and consistent level of data stewardship across the 2k Special Issue. We recognize that an additional effort will likely be required to meet the high level of data stewardship envisaged, and we appreciate dedication and contribution of the authors. This includes the use of Data Citations (see example in supplement). We ask authors to respond to our comments as part of the regular open interactive discussion. If you have any questions about PAGES Data Stewardship principles, please contact any of us directly.

Best wishes for the success of your paper,

2k Special Issue Data Review Team (Darrell Kaufman, Nerilie Abram, Belen Martrat, Raphael Neukom, Scott St. George) and ex-officio team members (Marie-France Loutre, Lucien von Gunten)

- (1) Add a "data availability" section that describes where the data can be accessed, including a Data Citation for the new data generated in this study (see below).

**Answer:** Five tree ring cellulose oxygen isotopes chronologies in this manuscript were not in a public repository, except for the data from Bhutan (available at DOI: 10.1002/jgrd.50664). This manuscript including two newly developed tree ring cellulose oxygen isotopes chronologies (JG and Ganesh) and another manuscript (Sano et al., submitted) including one tree ring cellulose oxygen isotopes chronology (Manali), which is also used in this manuscript, are still under review. Usually, these data should be open after the process of peer review. Therefore, we plan to contribute the data to NOAA Paleoclimatology Datasets (<https://www.ncdc.noaa.gov/data-access/paleoclimatology-data>) after both the manuscripts are published. We have added the description on the data availability in the Acknowledgments (red parts).

Acknowledgments:

This work was jointly funded by the Ministry of Science and Technology of the People’s Republic of China (Grant No. 2016YFA0600502), the Chinese Academy of Sciences (CAS) Pioneer Hundred Talents Program, the National Natural Science Foundation of China (Grant No. 41672179, 41630529 and 41430531), an environmental research grant from the Sumitomo Foundation, Japan, a research grant from the Research Institute of Humanity and Nature, Kyoto, Japan, and grant in-aid from the Japan Society for the Promotion of Science Fellows (23242047 and 23-10262). Indian Space Research Organization’s Geosphere Biosphere Programme supported RR and APD. This study was conducted in the framework of the Past Global Changes (PAGES) Asia2k programme. **The tree ring cellulose oxygen isotope**

data in this paper are available from the authors upon request ([cxxu@mail.iggcas.ac.cn](mailto:cxxu@mail.iggcas.ac.cn) and [msano@aoni.waseda.jp](mailto:msano@aoni.waseda.jp)) and NOAA Paleoclimatology Datasets (<https://www.ncdc.noaa.gov/data-access/paleoclimatology-data>). We deeply appreciate the helpful comments from three anonymous reviewers and the group members of SPATIAL laboratory at the University of Utah to improve the manuscript.

(2) Add Data Citations for each of the five datasets listed in Table 1, including both the previously published data, and the new data from this study. Note that the publication citation for record #3 is incorrect; a journal issue was assigned in 2012 (not 2011; doi:10.1177/0959683611430338).

**Answer:** Thanks for your suggestions. We have modified the Table 1 according to the suggestions.

Table 1. Tree ring cellulose oxygen isotope data sets used in this study

No.	Sample ID	Location	Period	Tree species	Mean	Climatic response of tree ring $\delta^{18}\text{O}$	Data source
1	Manali	32°13'N, 77°13'E, 2700 masl, India	1768-2008	<i>Abies pindrow</i>	29.97‰	Regional JJAS PDSI $r=-0.67$	Sano et al., submitted
2	JG	29°38'N, 79°51'E, 3849 masl, India	1641-2008	<i>Cedrus deodara</i>	30.39‰	Regional JJAS PDSI $r=-0.50$	This study
3	Hulma	29°51'N, 81°56'E, 3850 masl, Nepal	1778-2000	<i>Abies spectabilis</i>	25.94‰	Regional JJAS PDSI $r=-0.73$	Sano et al., 2012
4	Ganesh	28°10'N, 85°11'E, 3550 masl, Nepal	1801-2000	<i>Abies spectabilis</i>	23.01‰	Regional JJAS PDSI $r=-0.55$	This study
5	Wache	27°59'N, 90°00'E, 3500 masl, Bhutan	1743-2011	<i>Larix griffithii</i>	19.38‰	Regional JJAS PDSI $r=-0.59$	Sano et al., 2013

(3) Add a note to explain that the spelling of the site name used in the previous paper is “Julma” rather than “Hulma” as it appears in the current paper.

**Answer:** In the previous paper (Sano et al., 2012), Hulma is the name for sampling site, while Julma is the name of meteorological station.

(4) For those data not already in a public repository, submit essential metadata along with the time series shown in Figs 2a, 3a, and 4a, plus the averaged time series (H5) in Fig 4b, and its smoothed versions (Fig 10 (red) and Fig 11b (red)).

**Answer:** Metadata may be helpful for published data. For the unpublished data, Table 1 provided similar information (name, location, length, climate implication, data source, etc) with metadata. Anyway, we plan to submit the data to NOAA after the manuscript was published, it will contain necessary information.

Recommended additions:

- (1) Add Data Citations for each time series used to compare with the 18O tree-ring time series, including: Fig 5a (Indian rainfall); Fig 5b (Indian Monsoon); Fig 9 (ENSO from McGregor and Wilson); Fig 10 (Stalagmite 18O); Fig 11 (Tibetan temperature and Indian Ocean SST)

**Answer:** We have added the data citations for these records. Please see the following part.

Wang, B., Wu, R., and Lau, K., Indian monsoon index, <http://apdrc.soest.hawaii.edu/projects/monsoon/definition.html>, 2001

Mooley, D., Parthasarathy, B., Kumar, K., Sontakke, N., Munot, A., and Kothawale, D. Indian Institute of Tropical Meteorology Homogeneous Indian Monthly Rainfall Data Sets (1871-2014), [http://www.tropmet.res.in/static\\_page.php?page\\_id=53](http://www.tropmet.res.in/static_page.php?page_id=53), 2016

McGregor, S., Timmermann, A., and Timm, O.: A unified proxy for ENSO and PDO variability since 1650, World Data Center for Paleoclimatology, <https://www.ncdc.noaa.gov/paleo-search/study/8732>, 2010

Wilson, R., Tudhope, A., Brohan, P., Briffa, K., Osborn, T., and Tett, S.: Coral-based Tropical Sea Surface Temperature Reconstruction, World Data Center for Paleoclimatology, <https://www.ncdc.noaa.gov/paleo-search/study/6359>, 2006.

Sinha, A., Kathayat, G., Cheng, H., Breitenbach, S. F. M., Berkelhammer, M., Mudelsee, M., Biswas, J., and Edwards, R. L.: Trends and oscillations in the Indian summer monsoon rainfall over the last two millennia, Supplementary Data 2, Nat Commun, 6, 2015.

Tierney, J., Abram, N., Anchukaitis, K., Evans, M., Cyril, G., Halimeda, K., and Saenger, C., PAGES Ocean2K 400 Year Coral Data and Tropical SST Reconstructions, World Data Center for Paleoclimatology, <https://www.ncdc.noaa.gov/paleo-search/study/17955>, 2015.

Shi, F., Ge, Q., Bao, Y., Li, J., Yang, F., Ljungqvist, F. C., Solomina, O., Nakatsuka, T., Wang, N., and Zhao, S.: Asian 1,100 Year Multiproxy Gridded Summer Temperature Reconstructions, World Data Center for Paleoclimatology, <http://ncdc.noaa.gov/paleo/study/18635>, 2015.

Cook, E., Krusic, P., Anchukaitis, K., Buckley, M., Nakatsuka, T., Sano, M., and PAGES Asia2k Members: Asia 1200 Year Gridded Summer Temperature Reconstructions, World Data Center for Paleoclimatology, <https://www.ncdc.noaa.gov/paleo-search/study/19523>, 2013.

Wang, J., Yang, B., and Ljungqvist, F.: Eastern Tibetan Plateau 1000 Year Summer Temperature Reconstruction, World Data Center for Paleoclimatology, <https://www.ncdc.noaa.gov/paleo-search/study/20590>, 2015.

- (2) Submit for archival: (a) the correlation time series in Fig 9 and (b) the land-sea thermal contrast time series in Fig 11b (black).

**Answer:** The data are easily calculated using raw data of five tree ring cellulose oxygen isotope chronologies and other data in public repository. After we contribute tree ring oxygen isotope data to a public repository, other researchers can reproduce the data based on their own interests.