



WORKSHOP PAGES-IPA

CRESTR: An introduction to the CREST r-package to reconstruct climate from palaeoecological datasets

By Manuel Chevalier

Saturday, 3rd December

9:00 – 14:00

The CREST (Climate REconstruction SofTware) technique is a flexible probabilistic tool for reconstructing climate from palaeoecological datasets (*e.g.* pollen, rodents, forams)¹ that has been successfully employed to reconstruct multiple climate parameters (*e.g.* temperature, precipitation, moisture index) from different regions (*e.g.* South Africa, Colombia, Turkey). In contrast to the more commonly-used reconstruction techniques, such as the Modern Analogues or all the regression-based techniques that require extensive collections of modern proxy samples to produce reliable reconstructions, CREST uses modern proxy occurrence data to estimate the proxy-climate relationships (*e.g.* using sources like the GBIF database ([Global Biodiversity Information Facility](https://www.gbif.org/))). Capitalizing on these abundant and freely available data, CREST is thus more broadly applicable, making it an effective tool to produce climate quantifications in regions where these remain unmistakably absent².

To facilitate its use by the global community, CREST is now encapsulated in a dedicated R package *crestr* that includes calibration data for four terrestrial and two marine proxies³. In particular, the depth and richness of the plant calibration dataset enable its use on virtually any pollen record on the planet⁴.

To introduce the package and provide guidelines to produce high-quality climate reconstructions, an in-person workshop is organized. In detail, this workshop pretends: 1) to describe the fundamental theory that underpins the model, 2) demonstrate how the different R functions of the package can be parameterised to best model the data and 3) help participants use their datasets and produce *preliminary* reconstructions. Basic knowledge in R is preferable but not necessary to participate in the workshop. Details about the method and package can be found here: <https://mchevalier2.github.io/crestr/index.html>.

This in-person one-day workshop, organized in collaboration by PAGES-ECN and IPA-ECN, is intended to reach ECRs interested in quantitative paleoclimate reconstructions just after the IAL-IPA meeting which will be carried out in Bariloche. The workshop will be held on Saturday, 3rd December with a duration of 5 hrs (9:00 – 14:00), with a theory and practice part for the participants. The preregistration will be by [google form](#) until September 16, 2022.

REFERENCES

1. Chevalier, M., Cheddadi, R. & Chase, B. M. CREST (Climate REconstruction SofTware): a probability density function (PDF)-based quantitative climate reconstruction method. *Clim. Past* **10**, 2081–2098 (2014).
2. Chevalier, M. *et al.* Pollen-based climate reconstruction techniques for late Quaternary studies. *Earth-Sci. Rev.* **210**, 103384 (2020).
3. Chevalier, M. *crestr*: an R package to perform probabilistic climate reconstructions from palaeoecological datasets. *Clim. Past* **18**, 821–844 (2022).
4. Chevalier, M. Enabling possibilities to quantify past climate from fossil assemblages at a global scale. *Glob. Planet. Change* **175**, 27–35 (2019)