

climatrends: Precipitation and temperature indices for climate variability analysis in R

Kauê de Sousa^{1, 2}, Jacob van Etten², and Svein Ø. Solberg¹

¹ Department of Agricultural Sciences, Inland Norway University of Applied Sciences, Hamar, Norway ² Bioversity International, Rome, Italy

DOI:

Software

- [Review](#) ↗
- [Repository](#) ↗
- [Archive](#) ↗

Submitted:

Published:

License

Authors of papers retain copyright and release the work under a Creative Commons Attribution 4.0 International License ([CC-BY](#)).

Summary

Understand how climate variability drives ecological processes is a key approach to provide recommendations for climate adaptation and biodiversity conservation. **climatrends** aims to provide the toolkit to compute extreme precipitation and temperature indices that serves as input for climate models, crop modelling, trends in climate change and ecology. The climate variables available in **climatrends** were previously used to identify climate patterns in crop growing cycles (Kehel, Crossa, and Reynolds 2016), regional climate change assessment (Aguilar et al. 2005), the effects of agroclimatic indices on the performance of crop varieties (van Etten et al. 2019) and to validate self reported perceptions to climate change (de Sousa et al. 2018).

Implementation

Application: common beans

Application: time series

Further development

Integration with other datasets as they become available in R via API client packages.

Acknowledgements

This work was supported by The Nordic Joint Committee for Agricultural and Food Research (grant num. 202100-2817).

References

- Aguilar, E., T. C. Peterson, P. Ramírez Obando, R. Frutos, J. A. Retana, M. Solera, J. Soley, et al. 2005. “Changes in precipitation and temperature extremes in Central America and northern South America, 1961–2003.” *Journal of Geophysical Research* 110 (D23): D23107. <https://doi.org/10.1029/2005JD006119>.
- de Sousa, Kauê, Fernando Casanoves, Jorge Sellare, Alejandra Ospina, Jose Gabriel Suchini, Amilcar Aguilar, and Leida Mercado. 2018. “How climate awareness influences farmers’ adaptation decisions in Central America?” *Journal of Rural Studies* 64: 11–19. <https://doi.org/10.1016/j.jrurstud.2018.09.018>.

- Kehel, Z., J. Crossa, and M. Reynolds. 2016. "Identifying Climate Patterns during the Crop-Growing Cycle from 30 Years of CIMMYT Elite Spring Wheat International Yield Trials." In *Applied Mathematics and Omics to Assess Crop Genetic Resources for Climate Change Adaptive Traits*, edited by Abdallah Bari, Ardesir B. Damania, Michael Mackay, and Selvadurai Dayanandan, 151–74. CRC Press.
- van Etten, Jacob, Kauê de Sousa, Amílcar Aguilar, Mirna Barrios, Allan Coto, Matteo Dell'Acqua, Carlo Fadda, et al. 2019. "Crop variety management for climate adaptation supported by citizen science." *Proceedings of the National Academy of Sciences* 116 (10): 4194–9. <https://doi.org/10.1073/pnas.1813720116>.