

Resilience and long-term trends in vegetation dynamics of global drylands

Contact:

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Aim

To identify relationships between resilience and long-term trends in the dynamics of dryland vegetation at global scales

Drylands are sensitive ecosystems prone to experiencing irreversible changes in their functioning leading to desertification. Previous work has shown the prevalence of abrupt (rather than gradual) dynamical changes in dryland vegetation dynamics (Berdugo et al 2022) and of patterns of declining resilience and increased sensitivity to global change (Fournier de Lauriere, in review).



Research Objective

Unveil hotspots of current and future dynamical instabilities in drylands at global scale

Planned Activities

- Use trends and resilience estimates based on a 20-y global satellite-derived temporal assessment of dryland Normalized Difference Vegetation Index
- Identify the relationships between changes in resilience and dryland productivity
- Pinpoint hotspots of dryland vulnerability at global scale

Methods

- Manipulation of large-scale spatiotemporal remote-sensed data.
- Correlation, linear models, clustering statistical techniques.
- R coding/flow-work

What: an M2 thesis

Where: at BioDICee team in ISEM

When: spring 2024

Who: supervised by Vasilis Dakos and in collaboration with Miguel Berdugo (Univ Computense Madrid)

References

Berdugo, M., Gaitán, J.J., Delgado-Baquerizo, M., Crowther, T.W., Dakos, V., 2022. Prevalence and drivers of abrupt vegetation shifts in global drylands. *Proc. Natl. Acad. Sci. U. S. A.* 119, 1–10. <https://doi.org/10.1073/pnas.2123393119>

Fournier de Lauriere, C., Runge, K., Smith, G., Dakos, V., Kéfi, S., Crowther, T., Berdugo, M., Uncovering global drivers threatening vegetation resilience, in review