

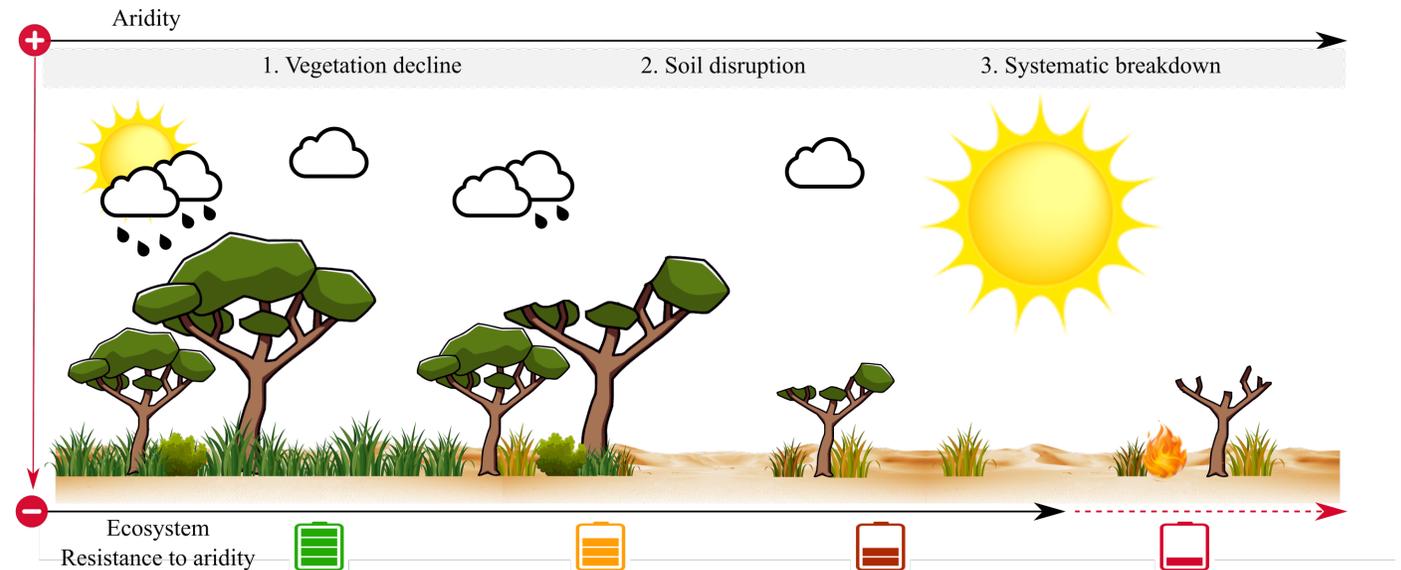
AridLand

The response and resistance of global tropical drylands to increasing aridity

WP1: To map changes in ecosystem variables (EV) and dynamics affected by increasing aridity.

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Which ecosystem variables will be assessed?

Vegetation

Vegetation productivity – Copernicus FAPAR

Vegetation cover – X-VOD (AMSR-E/ 2)

Vegetation functioning – SeRGS (based on Copernicus NDVI – ERA-5 precipitation)

Terrestrial live biomass – Xu et al.

Fire frequency

Soil

Top layer soil moisture (CCI Soil Moisture)

Root zone soil moisture (GLEAM, ERA-5)

ERA-5 albedo

Climate

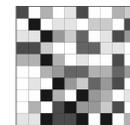
ERA-5 skin temperature

CCI Cloud Fraction

Plant functioning – VPD



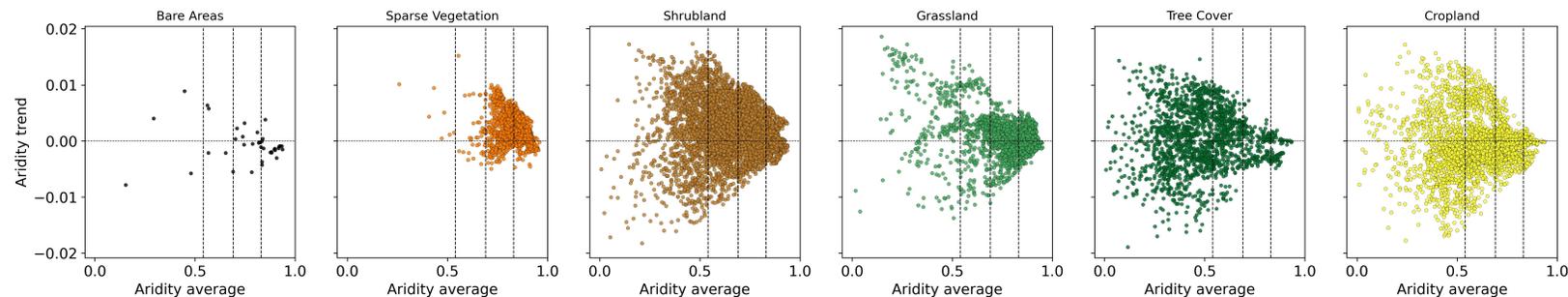
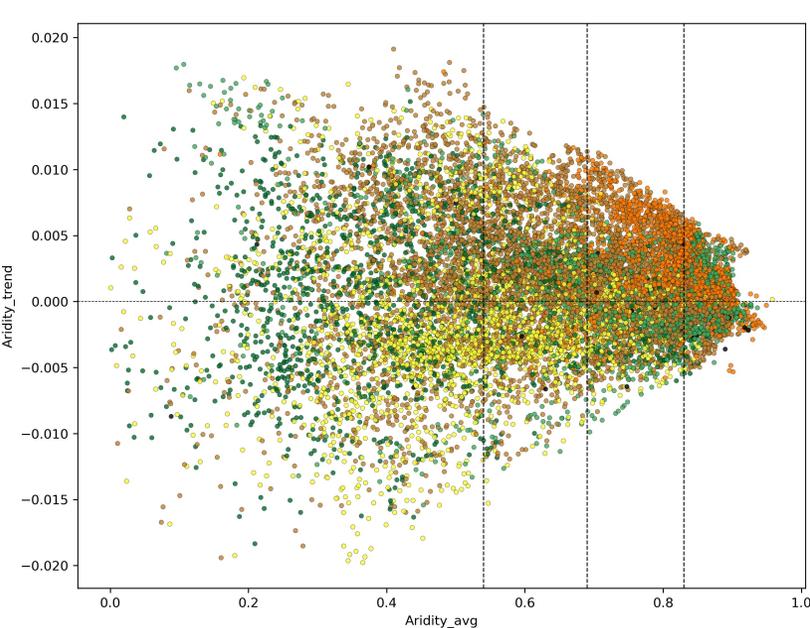
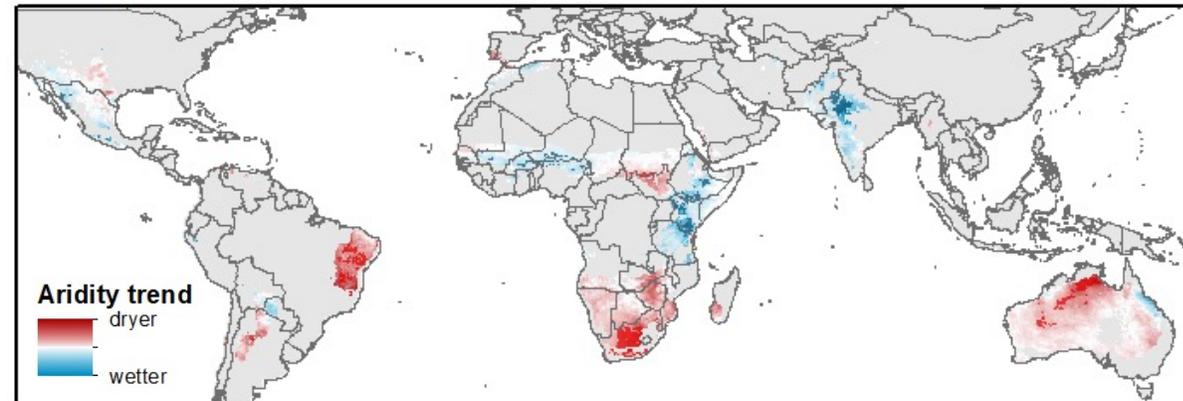
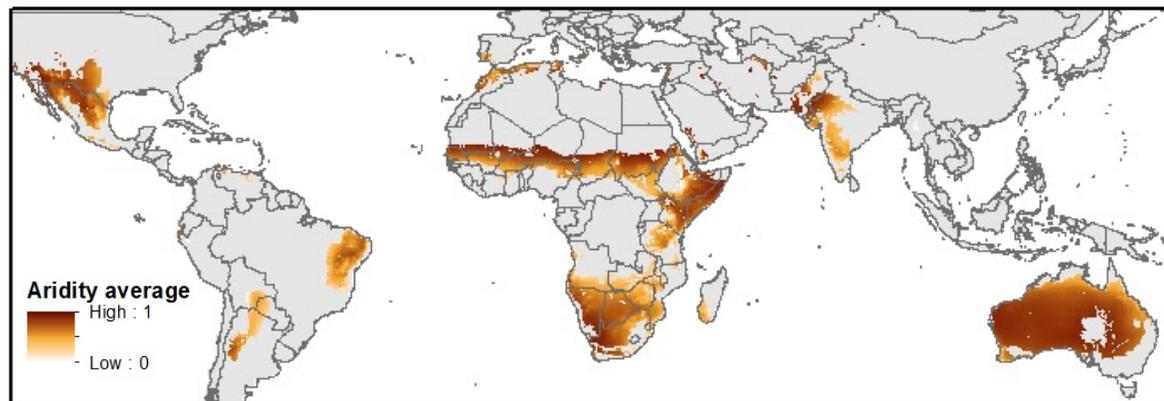
At the **global** tropical dryland scale



25km spatial resolution



Temporal resolution:
Yearly from 2000 to today



- color shows dominant LC as in 2015 (ESA CCI) (LU intensity would also be interesting)
- magnitude of aridity changes shrinks as aridity increases
- overall more positive trends in sparse vegetation and shrubland as compared to cropland
- vegetation – climate interaction?

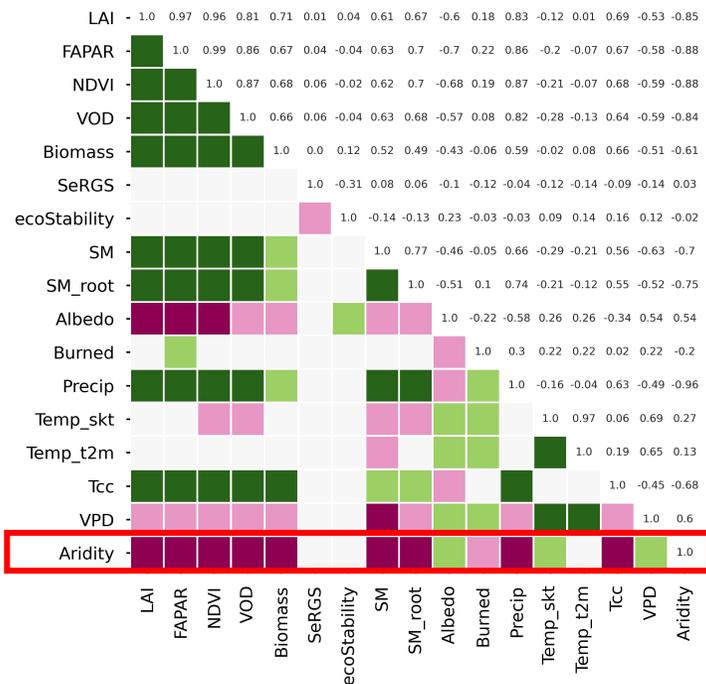
How to link ecosystem variables to aridity?

Relationship between the **averages, trends and breakpoints** in

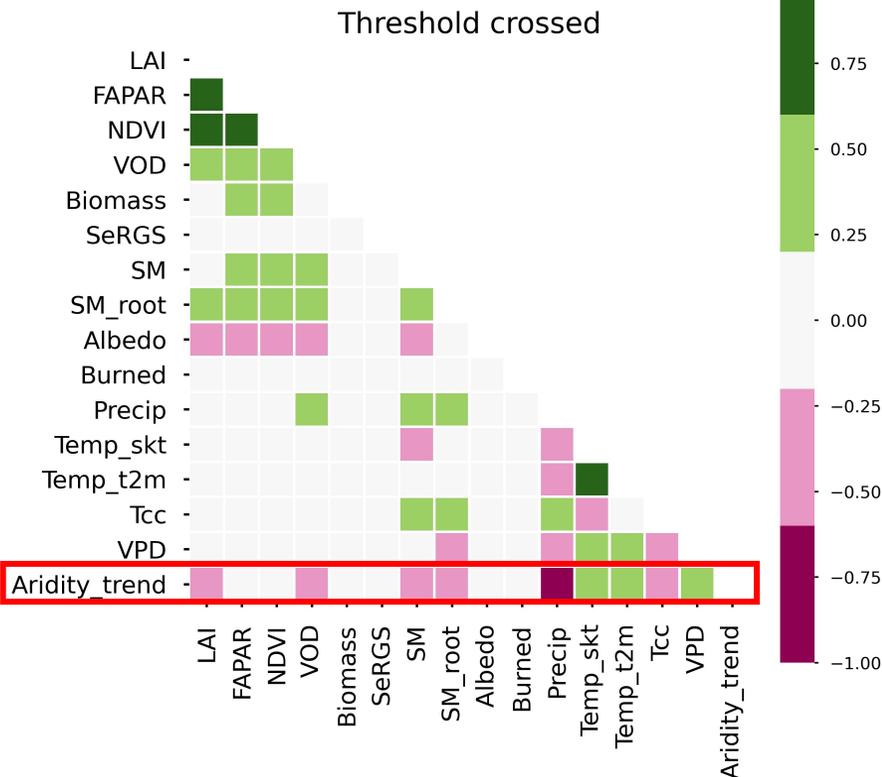
1. all tropical dryland pixels and
2. specifically where a threshold has been crossed/ reversed

in progress

Spatial correlation of ecosystem variables with aridity (average over time period)



Spatial correlation of **trends** in ecosystem variables with the aridity trend



- Overall: stronger correlations in averages than in trends
- In areas where a threshold has been crossed: Trends in ecosystem variables (linked to vegetation) decoupled from trends in aridity?
- Correlation of potential **breakpoints** in aridity and variables to be next.