How global dryland vegetation dynamics relate to changing climatic conditions and anthropogenic dynamics

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Data and Method

- Sequential linear regression slopes (SeRGS) characterizng vegetation sensitivity to rainfall – as a proxy for vegetation functioning in drylands

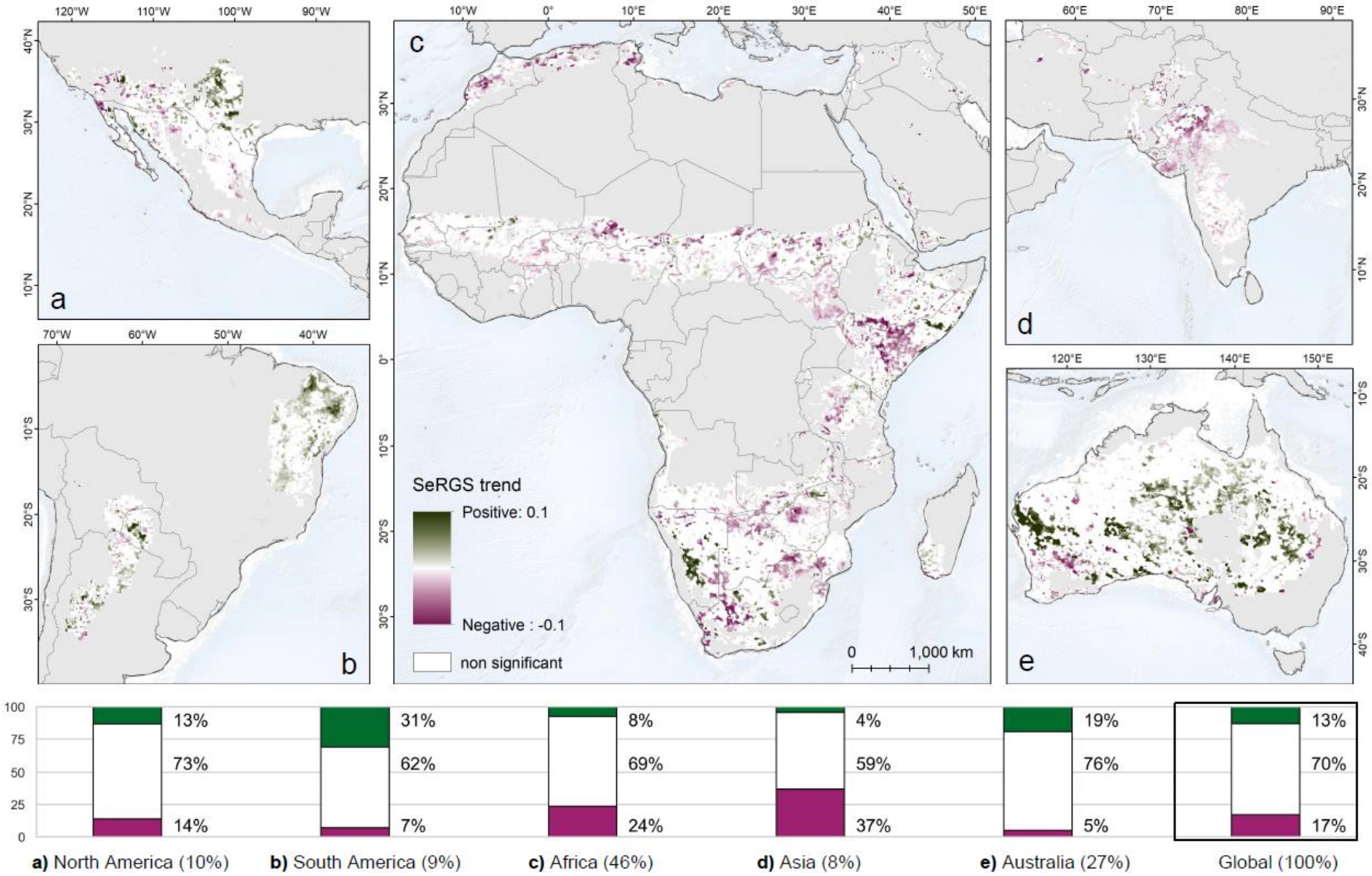
  Abel, C., Horion, S., Tagesson, T., Brandt, M., Fensholt, R. (2019). Towards improved remote sensing based monitoring of dryland ecosystem functioning using sequential linear regression slopes (SeRGS). Remote Sens. Environ. 224, 317–332.

- MODIS NDVI and MSWEP rainfall data
- 2000 – 2015 @ 0.05 degree spatial resolution

- Empirial, data driven approach to identify drivers – based on Principal Component Analysis/ Regression

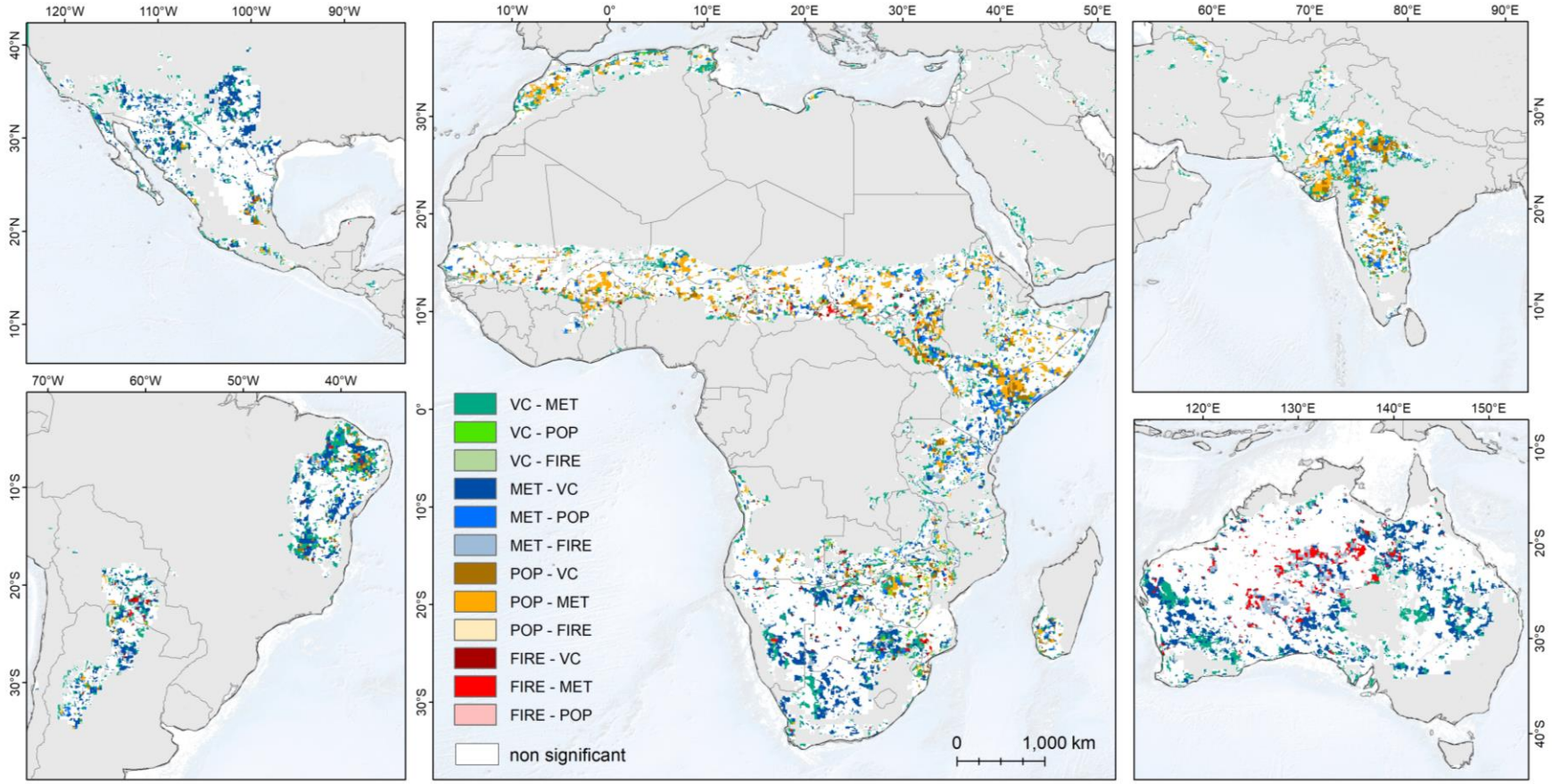
  Inspired by:
  Seddon, A. W. R., Macias-Fauria, M., Long, P. R., Benz, D. & Willis, K. J. Sensitivity of global terrestrial ecosystems to climate variability. Nature 531, 229 (2016).

Trends of vegetation sensitivity to rainfall from 2000 - 2015

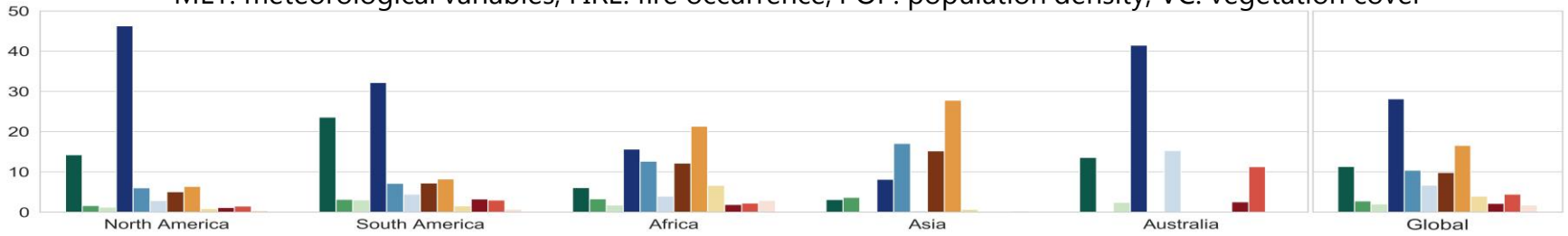


(by SeRGS method presented in Abel et al. 2019, RSE)

Main driver combinations (most and second most important driver) of trends in vegetation-rainfall-sensitivity.



MET: meteorological variables, FIRE: fire occurrence, POP: population density, VC: vegetation cover



Conclusions

Abel, C. et al. How the human-environment nexus alters vegetation-rainfall-sensitivity in tropical drylands. Nat. Sustain. ***in revision****, (2020)*

- **Continental differences** in vegetation functioning in global tropical drylands, **depending on geographic location and socio-economic situation**

- Drivers vary as much

- **Population** main driver **of negative changes** especially for **developing countries**

- **Positive changes** in vegetation rainfall-sensitivity in **richer countries**, mainly driven by **favorable climatic** conditions