

BACKGROUND

MOTIVATION

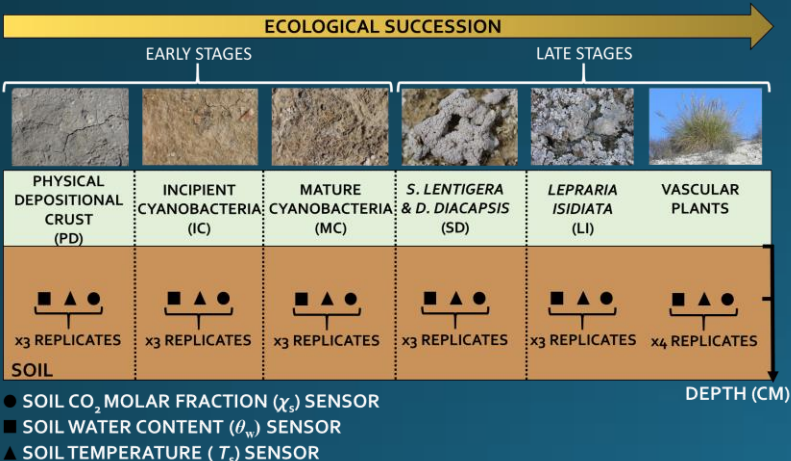
- It is still unknown how soil CO₂ fluxes evolve during the ecological succession of biocrusts and which factors control them.
- In drylands, potential abiotic processes of CO₂ uptake are still debated while estimates of the biotic contribution of photosynthesizing biocrusts to the net carbon uptake remain uncertain.

MAIN OBJECTIVE

- To identify the factors controlling soil-atmosphere CO₂ fluxes

METHODOLOGY

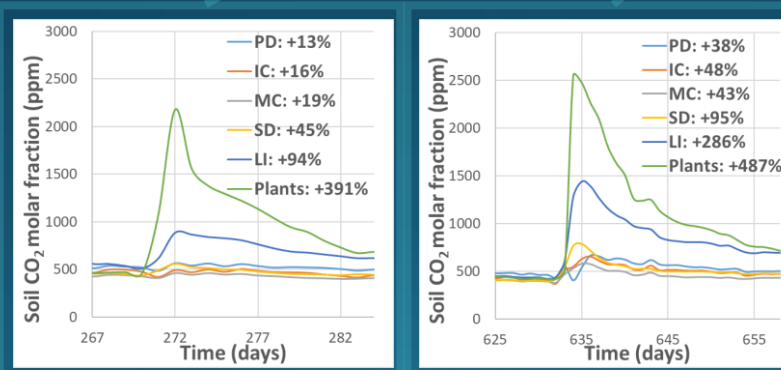
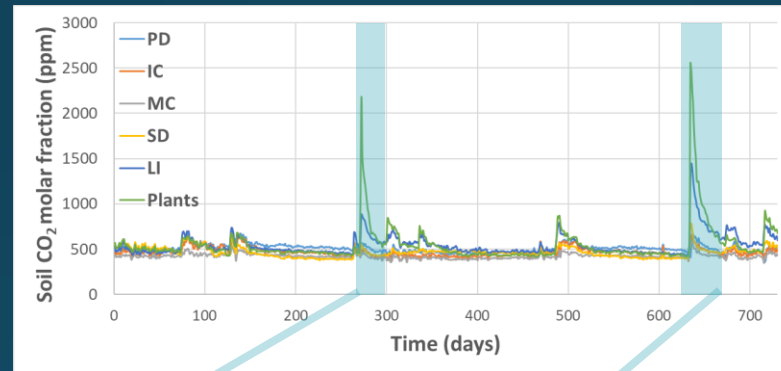
- Automated continuous measurements (every 20 min.) over 2 years
- Replicated spatially over the ecological succession of biocrusts
- Spatio-temporal statistical analysis



MAIN FINDINGS I

CO₂ PRODUCTION PROCESSES

- Pulse response to precipitation
- Mainly controlled by θ_w interacting with T_s and antecedent moisture conditions (Birch effect)
- Sensitivity to θ_w ↗ from early to late successional stages



- Other identified drivers:
 - Soil organic carbon
 - Porosity

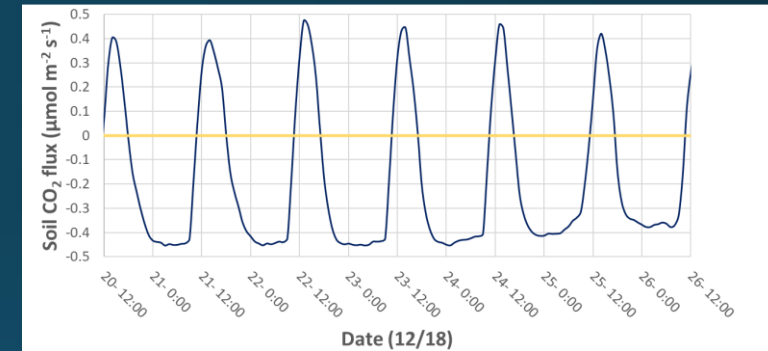
ACKNOWLEDGEMENTS

Funded by the research projects CGL2016-78075-P of the Spanish National Program and P18-RT-3629 of the Andalusian Regional Government including European Union ERDF.

MAIN FINDINGS II

CO₂ CONSUMPTION PROCESSES

- Observed at night, mainly in early stages of succession
- Able to offset CO₂ emissions in some locations (115% of efflux)



- Results suggest a geochemical process of CaCO₃ dissolution

SUMMARY

