

The resilience of soil erosion rate under LUC and the role of the Mediterranean grassland.

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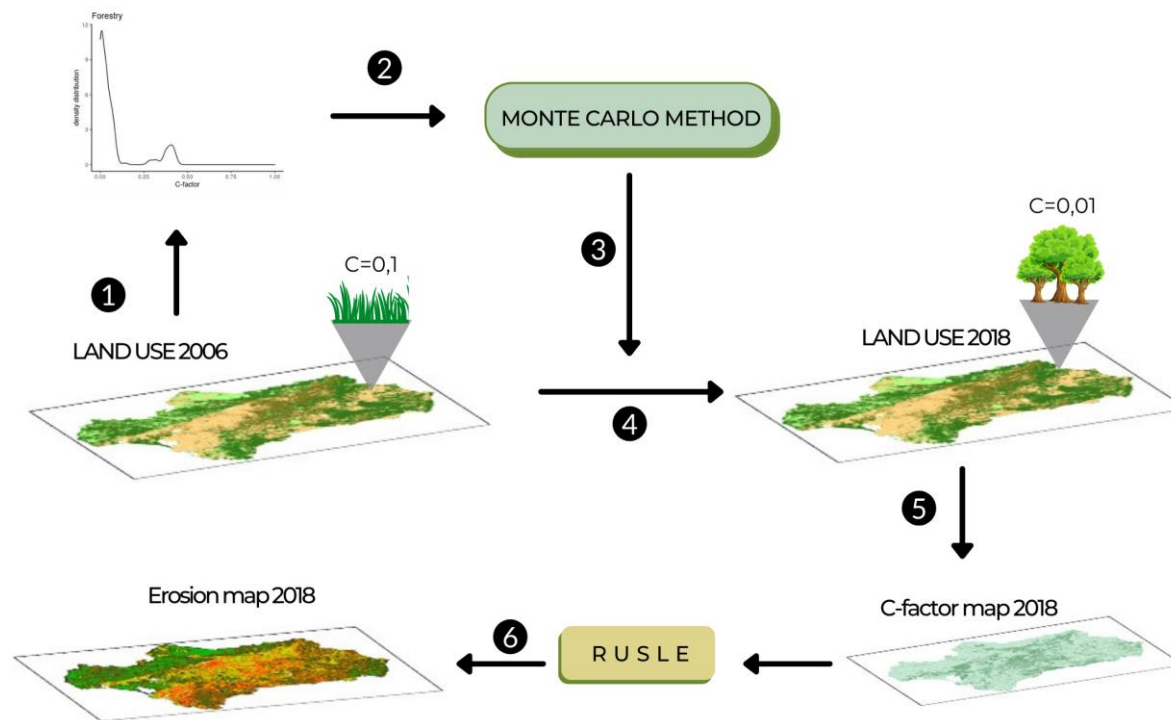
SUPER-G
SUSTAINABLE PERMANENT GRASSLAND



Main objectives:

- (i) To quantify and analyze the historical LULC between 1956 and 2018 in Southern Spain.**
- (ii) To quantify the current importance of PG for soil conservation**
- (iii) To calculate soil erosion rates for past, future and potential land use scenarios, by varying the C-factor of the RUSLE model through a Monte Carlo approach.**

Materials and Methods



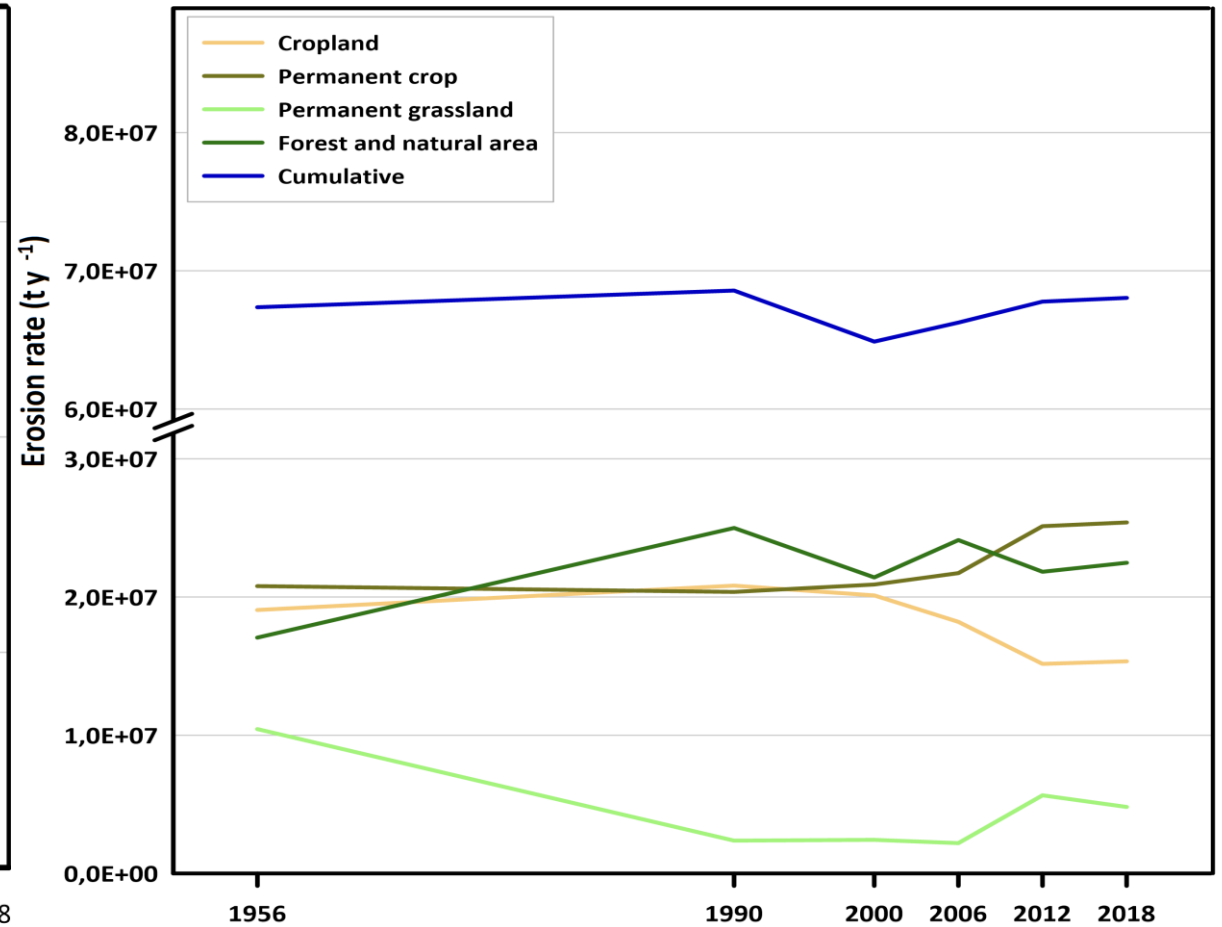
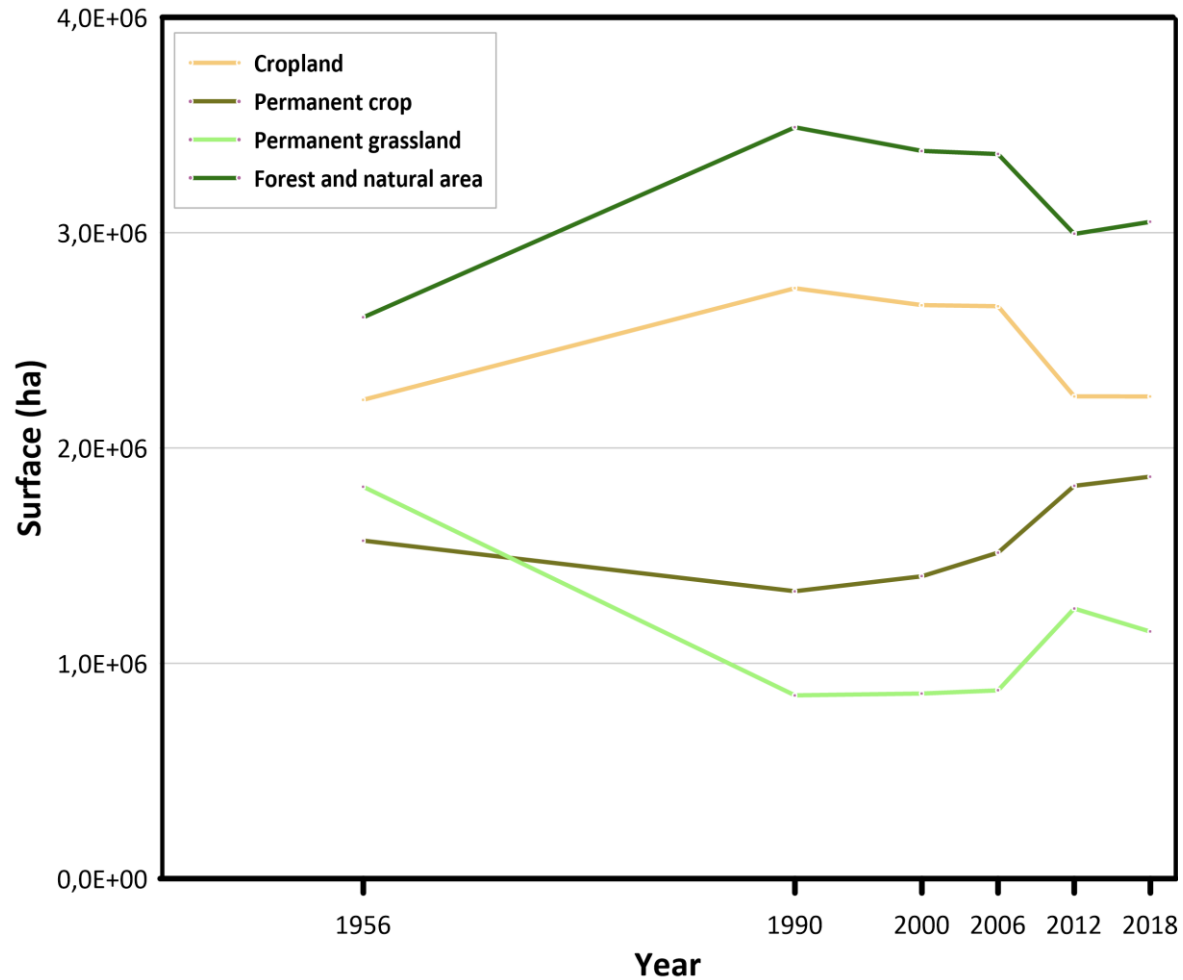
Materials

- Corine Land cover maps from 1990 to 2018
- Regional Land use map of 1956
- European RUSLE's factor maps (Panagos et al.,2014, Panagos et al.,2015a, Panagos et al.,2015b, Panagos et al.,2015c)

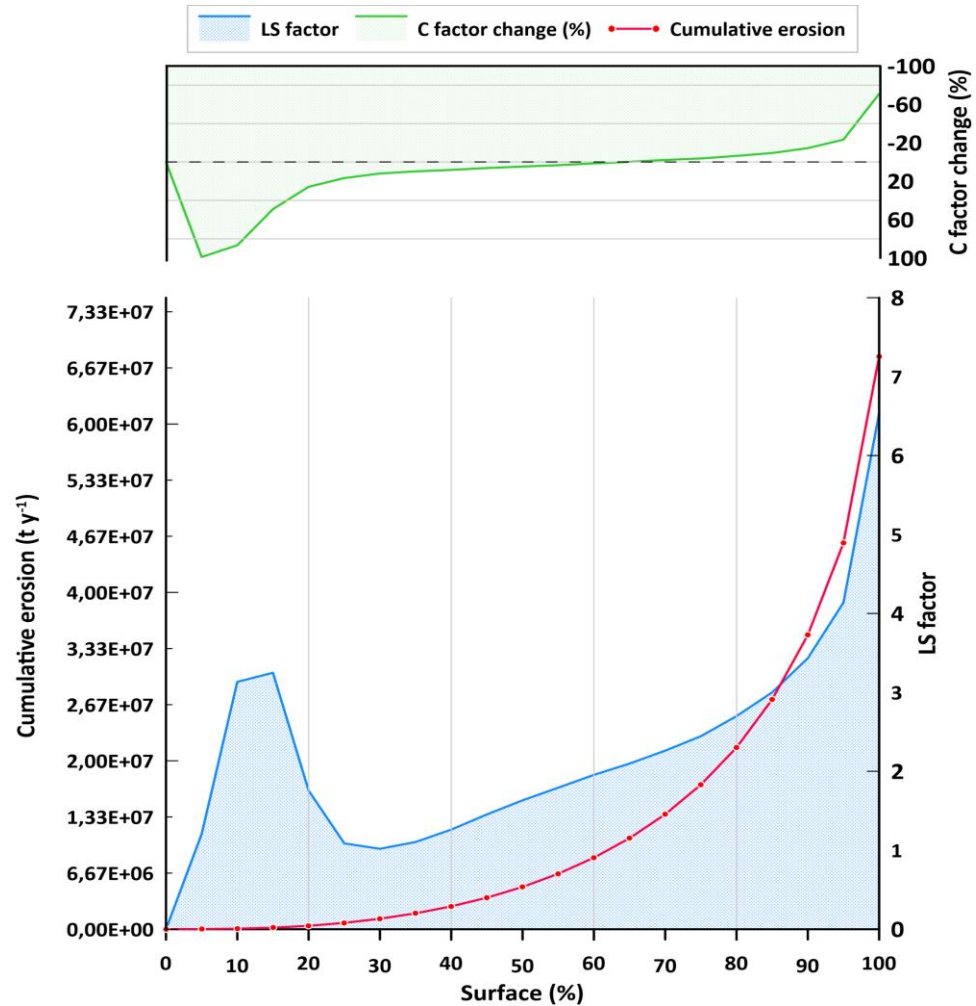
Methods

- LU map reclassification
- C-values extraction
- Spatial allocation by MCM

Results: LULC and Historical erosion



Contribution of surface to cumulative erosion rate

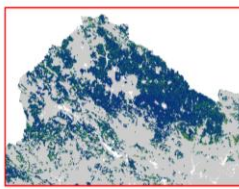
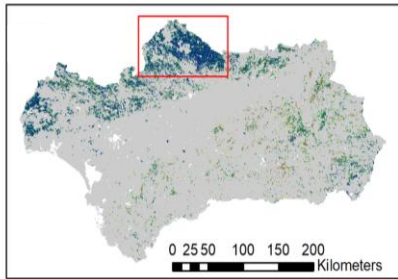


From further analysis ...

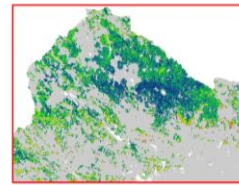
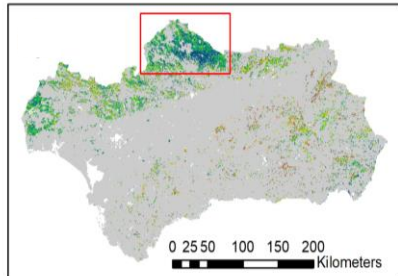
- **K- factor** and **R- factor** did not variate significantly from 1956 and 2018
- **LS- factor** is the dominant factor in the erosion rate production

67% of the total erosion is produced by the 20% of the surface

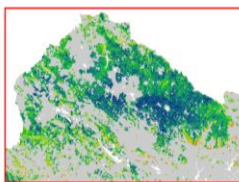
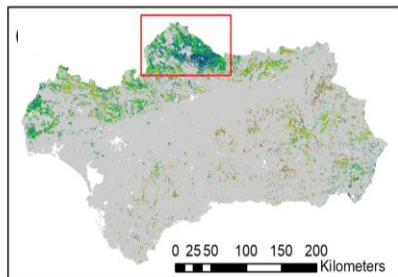
The role of the PG in erosion mitigation



FP



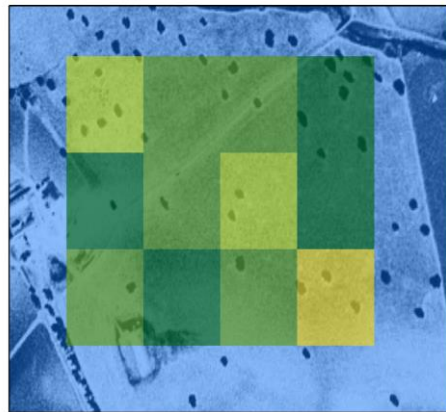
CP



PP

Erosion rate
t ha⁻¹ y⁻¹

- 30,1 - 40
- 25,1 - 30
- 20,1 - 25
- 10,1 - 20
- 8,1 - 10
- 5,1 - 8
- 3,1 - 5
- 2,1 - 3
- 1,1 - 2
- 0 - 1



1956

Scenario	Mean (t ha ⁻¹ y ⁻¹)	Cumulative change (%)
2018	8,2	0%
PP	9,3	<u>13 %</u>
CP	9,3	<u>14%</u>
FP	8,2	0 %

FP= Total change of PG to Forest

CP= Total change of PG to Cropland

PP= Total change of PG to Permanent crop

Conclusion

- Erosion rates were found resilient to land use change, with very little change.
- This resilience is due to erosion “hotspots” that control most of the response, as only 20% of the area causes 67% of the total, regional erosion
- Importance of permanent grasslands, as its conversion to permanent crop and cropland increased soil erosion with respectively 13% and 14 %

Thanks for the attention!

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