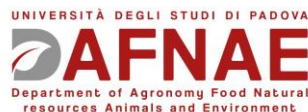


Pasture use intensity and vegetation: insights from multi-year GPS tracking and remote sensing in historical alpine pasture of the Eastern Alps

S. Raniolo^{1,2}, S. Da Re¹, A. Ceppatelli¹, E. Sturaro¹

University of Padova, DAFNAE¹ and TESAF²

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Dipartimento Territorio
e Sistemi Agro-Forestali
Università di Padova



To investigate the relation between pasture-use (days of use during the summer) and late-season vegetation productivity (NDVI – Residual NDVI) across different vegetation types of an historical alpine pasture

Area (historical summer farm)

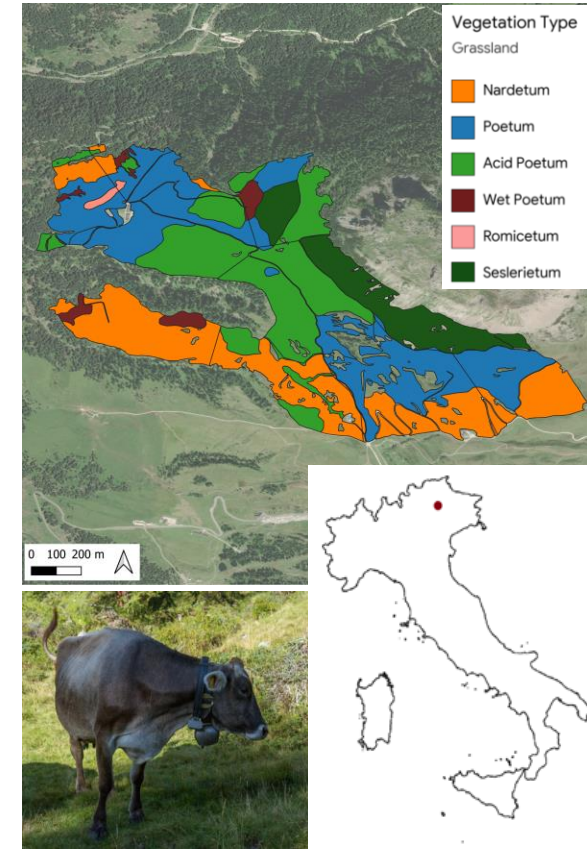
- Eastern Alps - Italy
- 180 ha (1900 m a.s.l. $\pm$ 90)
- Six vegetation types (grassland)

Herd of Dairy Cows

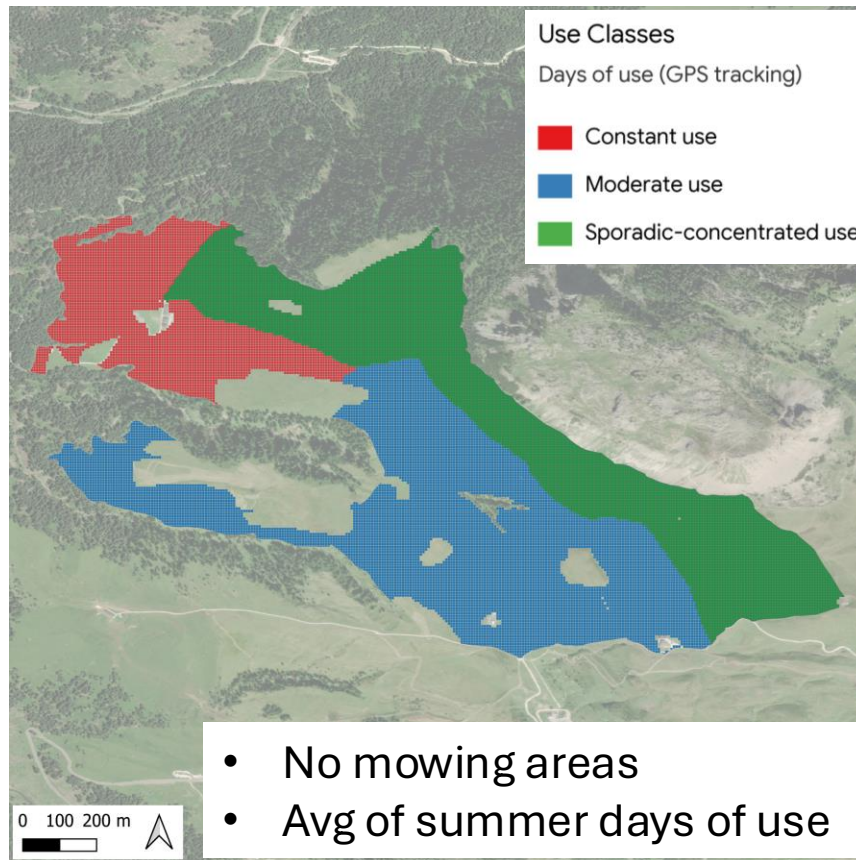
- 150 dairy cows (from different dairy farms)
- 2 milkings per day
- Shepherd herding during the day in different areas
- Night resting in a confined area close to the barn

Monitoring (2019, 2020, 2023, 2024, 2025)

- GPS tracking (2-min interval, July 11 – Sept 5) on dairy cows
- Shepherd diaries of used areas (validation)



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NDVI from Sentinel-2 (10m)

- Peak of Summer ($NDVI_{max}$)
- Sept-Oct value (late regrowth)



Response variables

$$NDVI_{Sept-Oct}$$

$$NDVI_{residual} (NDVI_{Sept-Oct\ i} / NDVI_{max\ i})$$

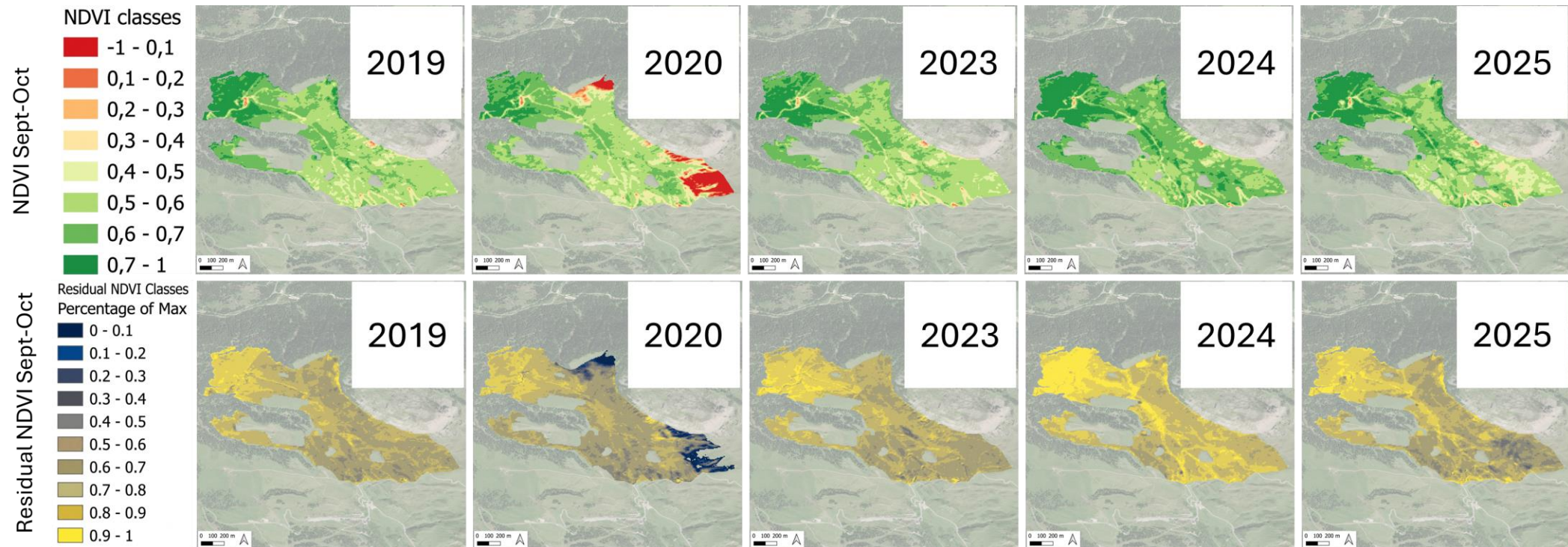


Analysis (GAM)

$$Y = \alpha + \beta_1 (Vegetation_i \times Use\ Class_{iy}) + \epsilon_{iy}$$



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THANK YOU

for your attention!



UNIVERSITÀ DEGLI STUDI DI PADOVA
DAFNAE
Department of Agronomy Food Natural
resources Animals and Environment

TESAF

Dipartimento Territorio
e Sistemi Agro-Forestali
Università di Padova

