

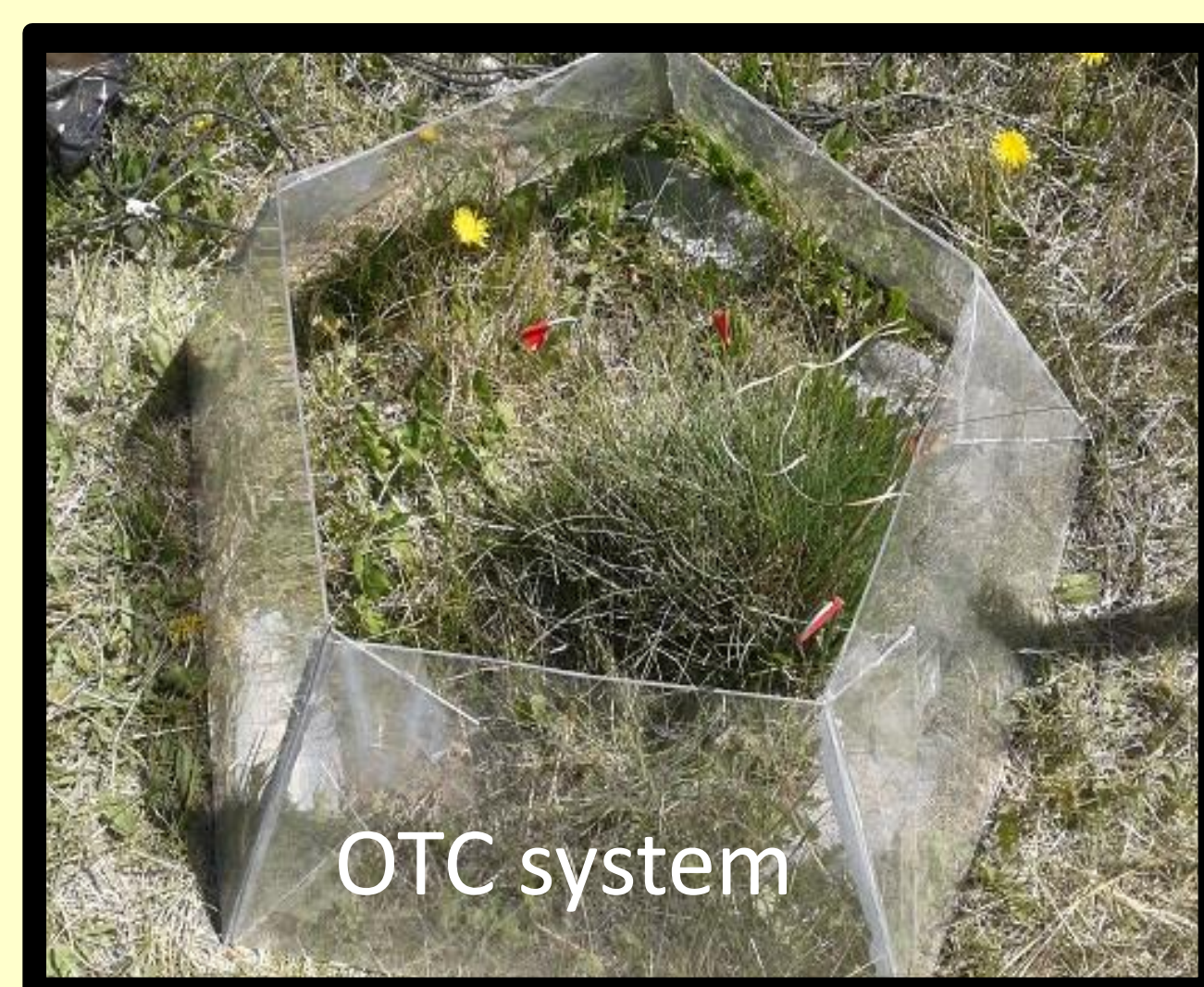
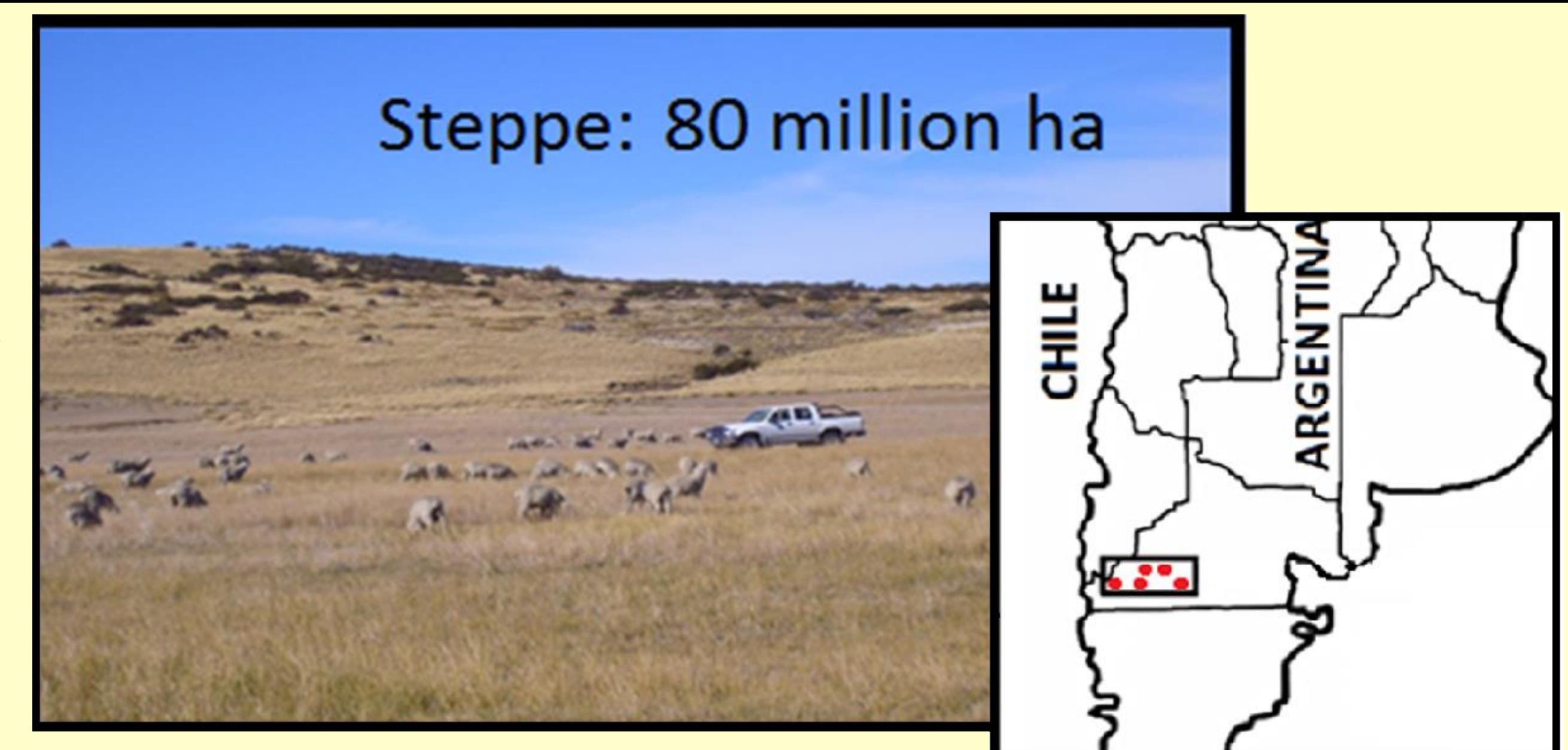
Adaptation to climate change: thinking about new management strategies for Patagonian meadows

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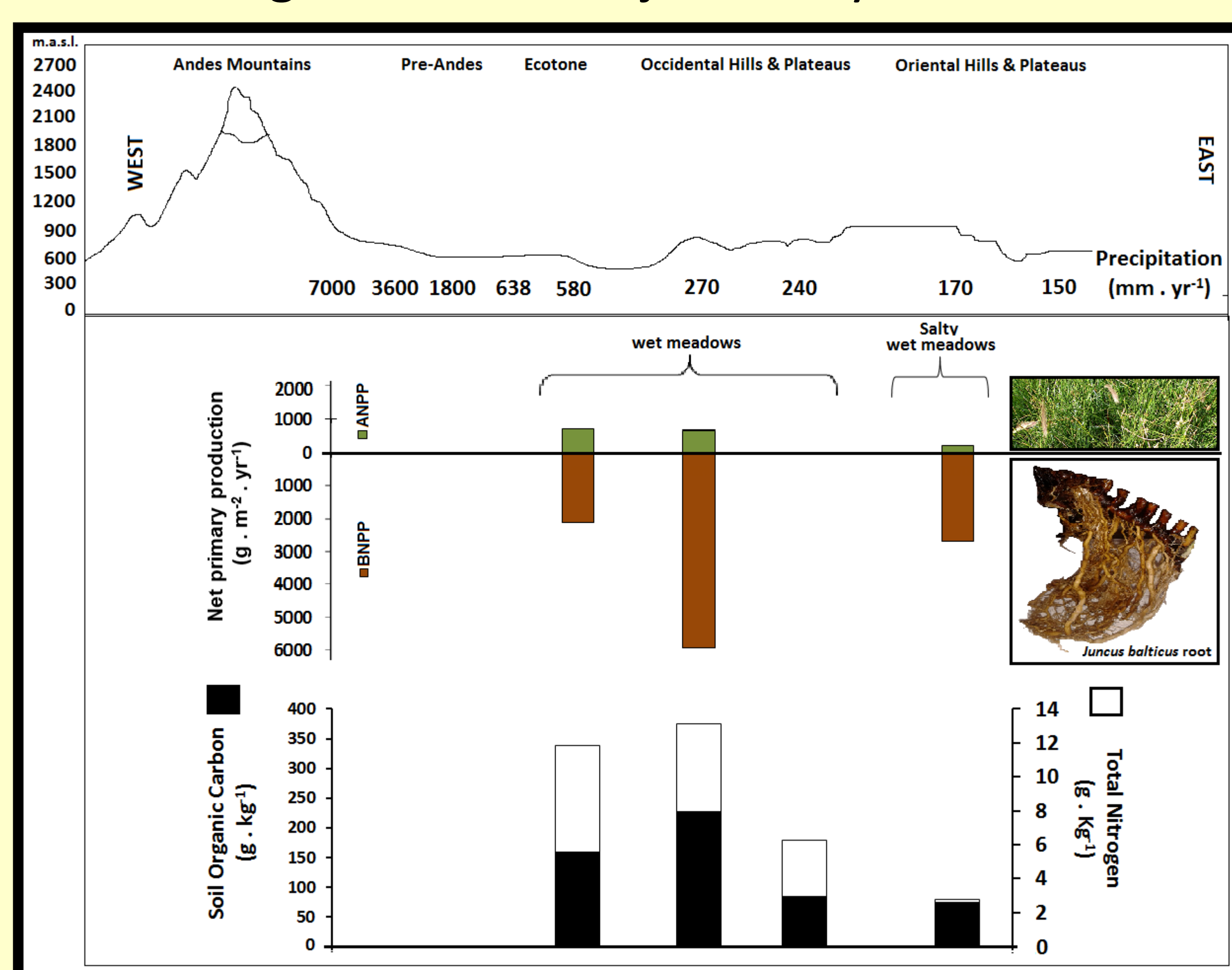
Introduction: Efforts to address climate change consequences and to alleviate poverty are increasing globally. In dry areas sustainable land management practices are especially needed. North Patagonian meadows provide key natural resources and ecosystem services but are poorly understood and badly managed.

Objective: Study the effect of changes in temperature and water regimes on structural and functional features of meadows.

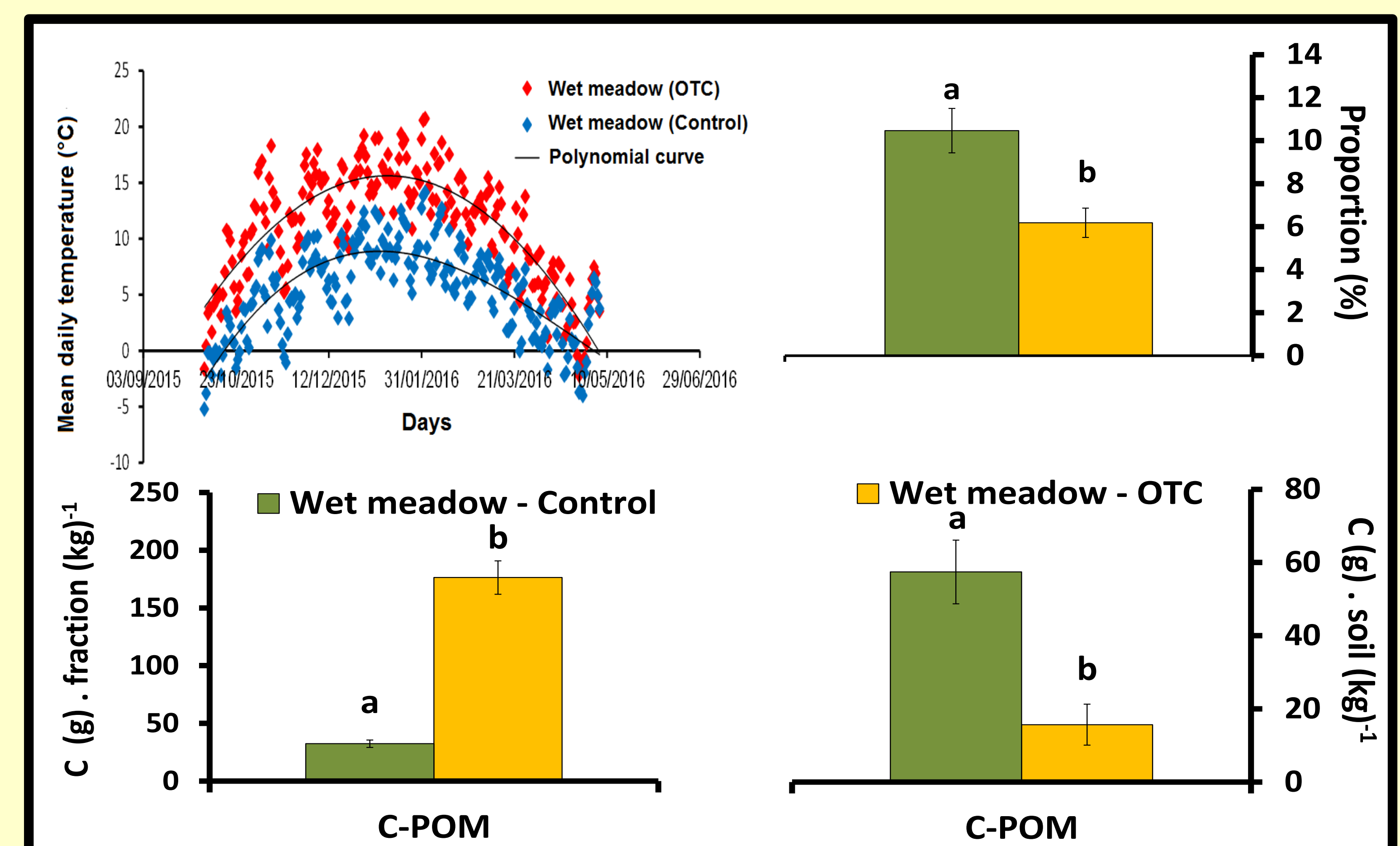


Methodology: We evaluated the link between soil and plant parameters and water inputs, through observational studies in meadows located in three points of a West-East precipitation gradient (650, 250, and 150 mm yr⁻¹). We also studied how soil organic matter in meadows change with an artificially increase in the mean annual temperature (MAT), through manipulative essays on the field with open top chambers (OTC).

Results: Mean annual precipitation (MAP) has influence on aerial and belowground net primary production and in the soil organic carbon and nitrogen; however data show that the local hydrology (runoff input with effect in the hydroperiod) can have stronger influence than the MAP. The increase in MAT generated a strong modification in the structure and quality of the particulate organic matter in just one year.



Soil organic carbon and nitrogen, and above and belowground net primary production.



Coarse particulate organic matter (C-POM) in meadows with OTC treatments and their controls. Average from 3 study sites (270 mm yr⁻¹), each with 2 OTC, and 5 soil samples collected from each treatment. ANOVA, $p < 0.05$.

Conclusions: As scenarios for 2090 in Patagonia predict an increase in the MAT and a modification in the water regimes, and as the present land use is damaging soil structure in Patagonian meadows, our results reflect the need of exploring new management strategies to reach sustainable use in the coming years.