

# MONITORING CLIMATE AND LAND-USE CHANGE IMPACTS ON ALPINE VEGETATION DYNAMICS AND CARBON SINKS

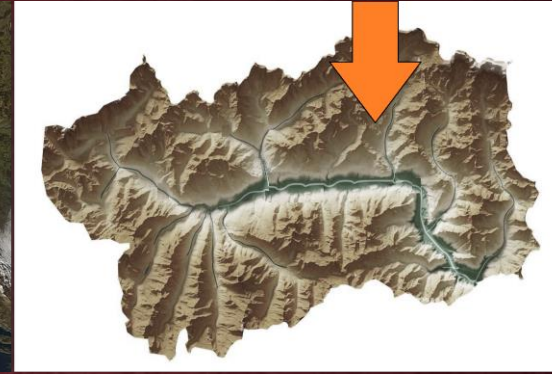
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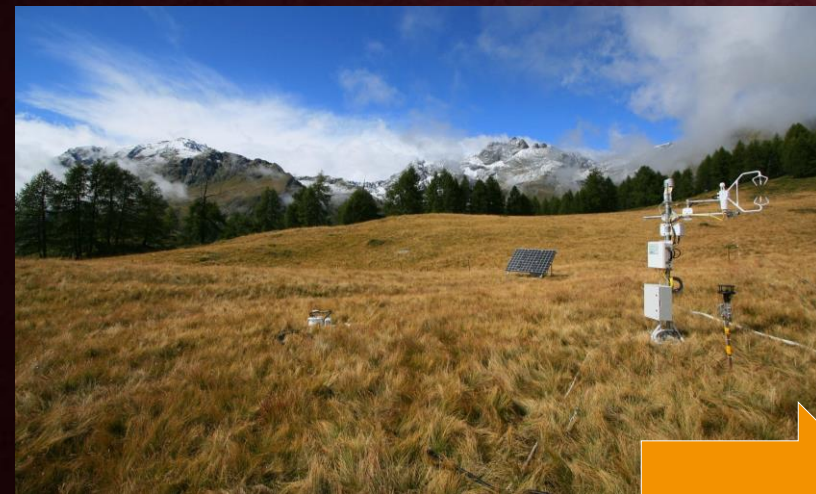




# INTRODUCTION: MONITORING SITES



Aosta Valley  
region,  
northwest  
Italian Alps,  
2100 m asl



ICOS Associated site Torgnon (IT-Tor)

ICOS

Ecosystem  
Thematic  
Centre

Transition from the abandoned pasture to a mature larch forest



# METHODS: TO ESTIMATE VEGETATION GROWTH

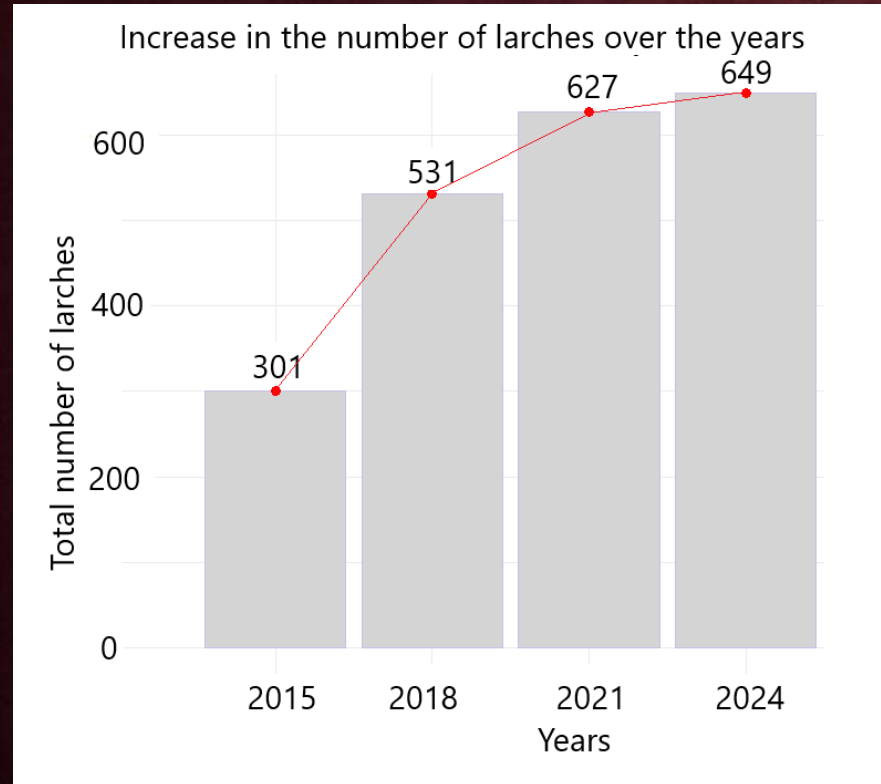


- ❑ Abandoned subalpine pasture (total exclusion since 2010)
- ❑ Area of 15000 m<sup>2</sup>
- ❑ Field surveys on larches and shrub species
- ❑ GNSS mapping (5 cm accuracy)
- ❑ Annual UAV images (since 2012)
- ❑ New installed eddy covariance station in November 2024 on encroached area

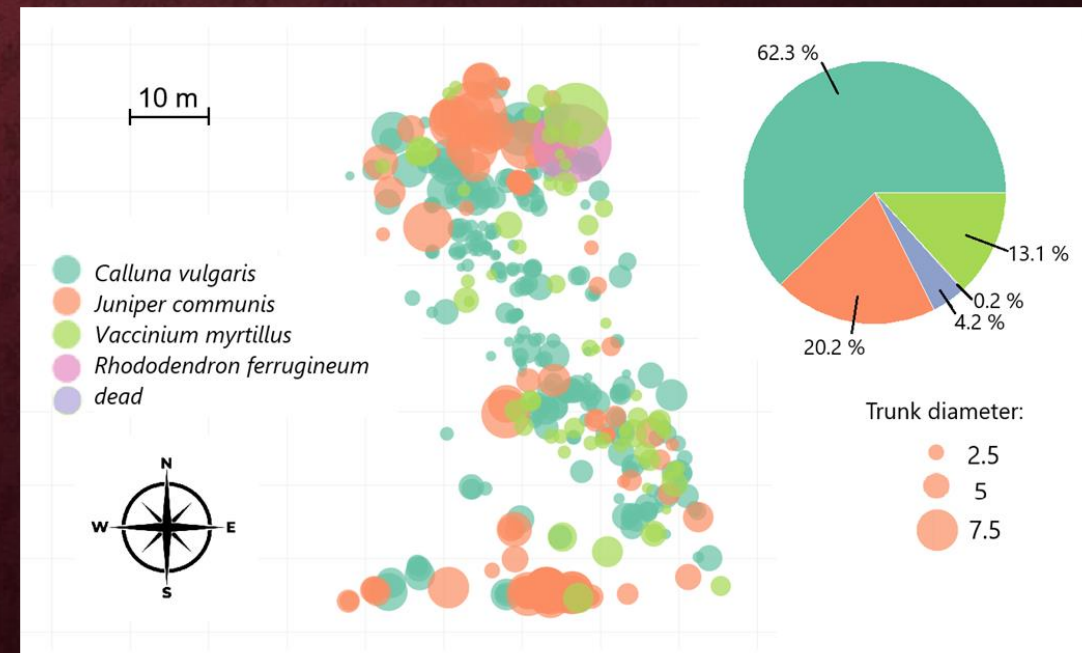
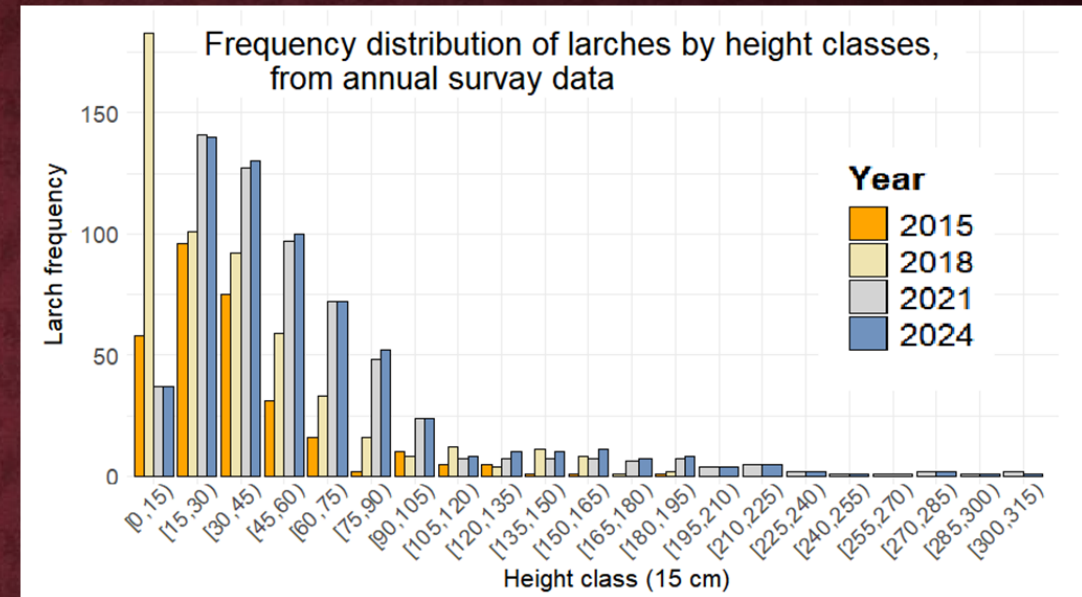




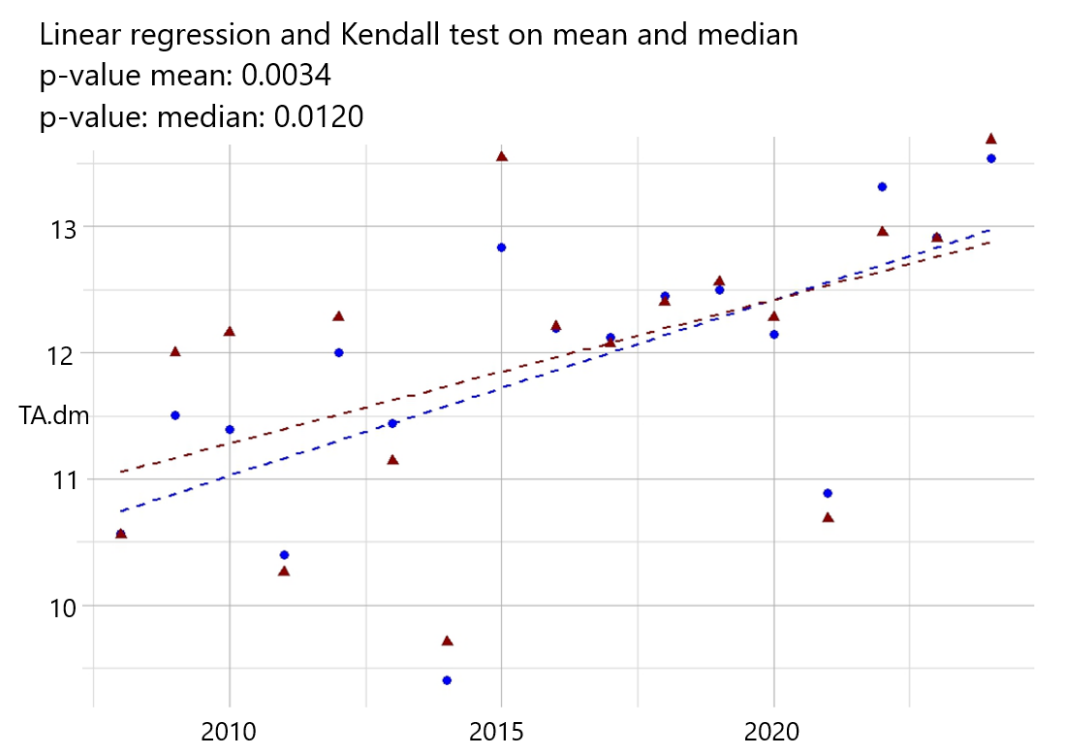
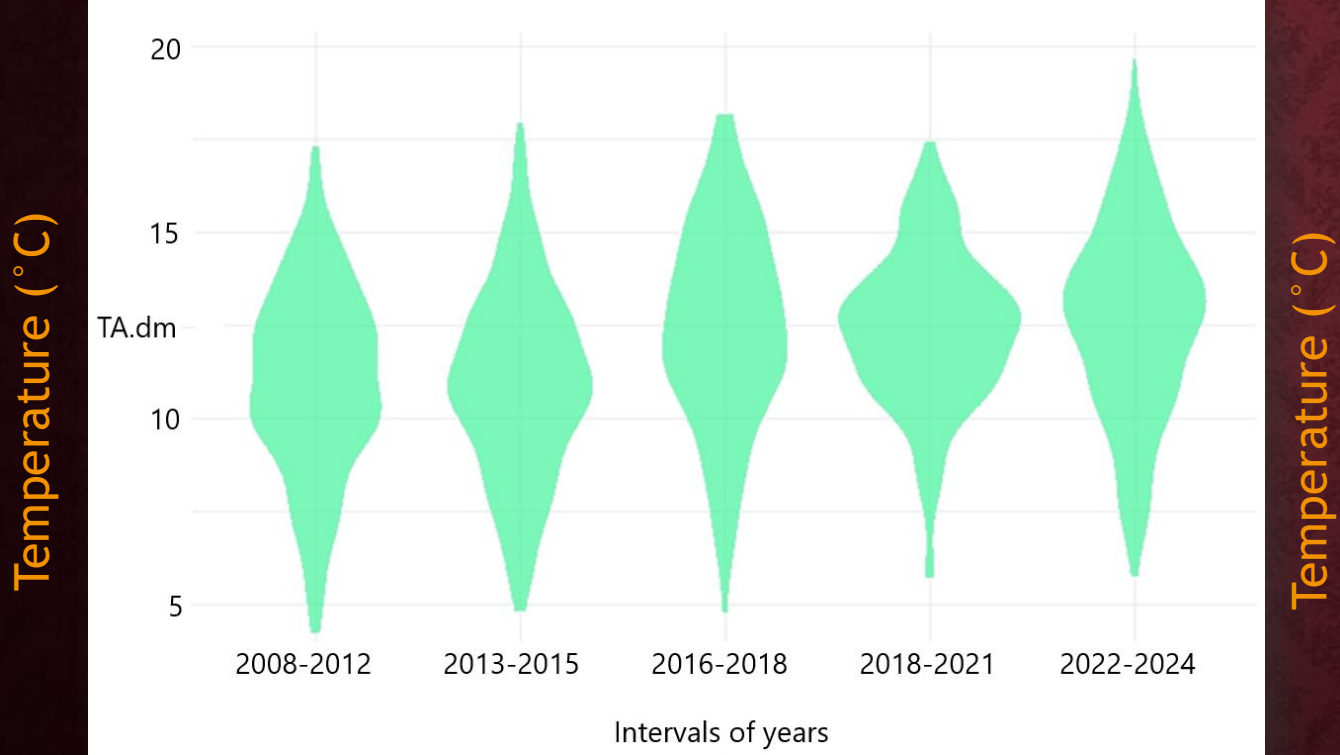
# SURVEY RESULTS



In recent years, an increase in size rather than in number has been observed. The presence of shrubs at the base of the trunk seems to be a requisite condition.



# GROWING SEASON MEAN TEMPERATURE, INCREASING TREND

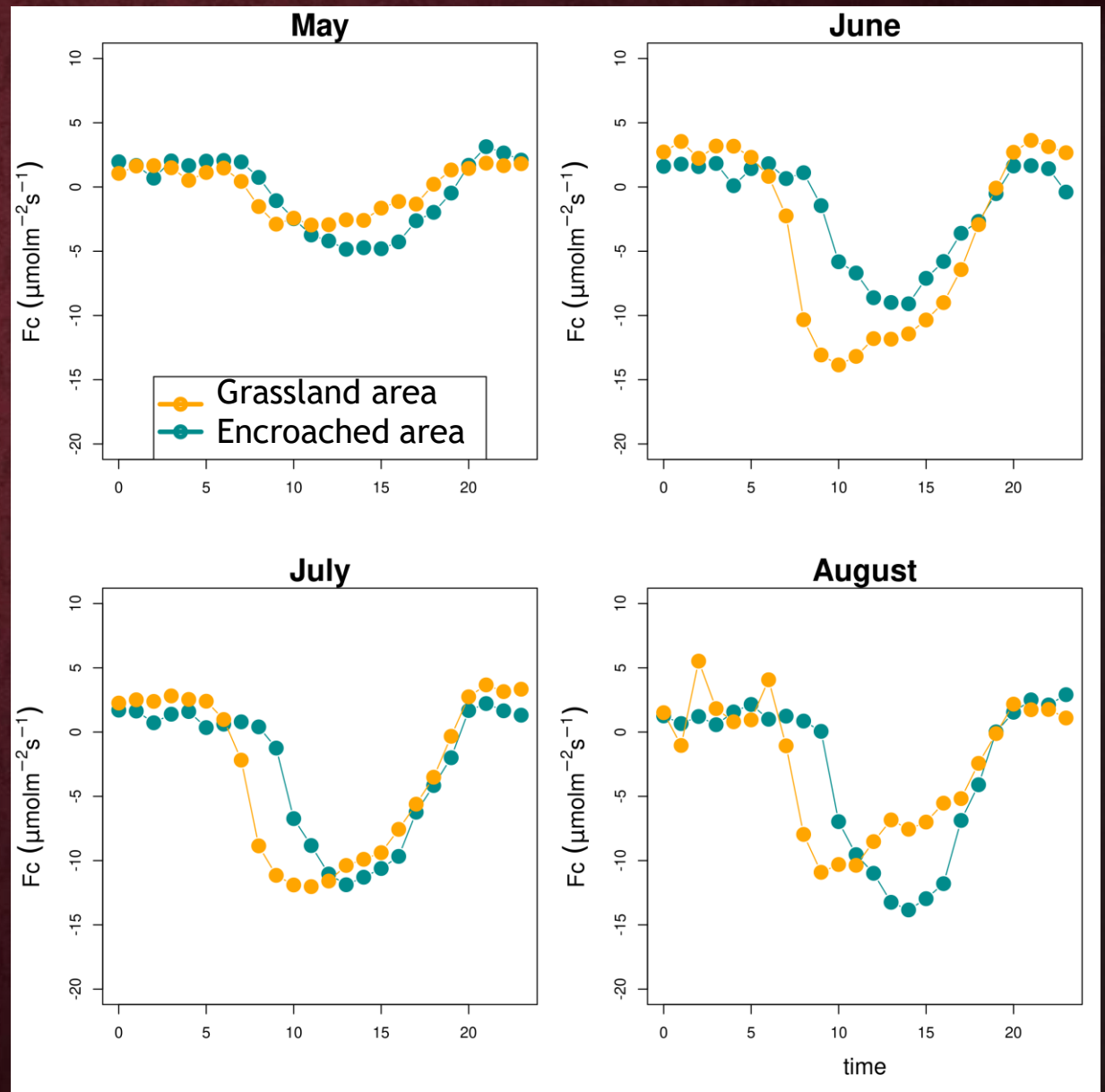


Daily mean **air temperature** data July and August (peak of the growing season)

# CO<sub>2</sub> FLUXES FROM THE NEW INSTALLED EDDY COVARIANCE STATION

Disentangling the effects of grazing  
abandonment and climate change  
on vegetation dynamics  
and carbon sequestration

Year 2025: mean diurnal variations







**THANK YOU FOR YOUR ATTENTION !  
DO YOU HAVE ANY QUESTIONS,  
COMMENTS, THOUGHTS OR  
SUGGESTIONS... ?**

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