

What am I
doing here ?

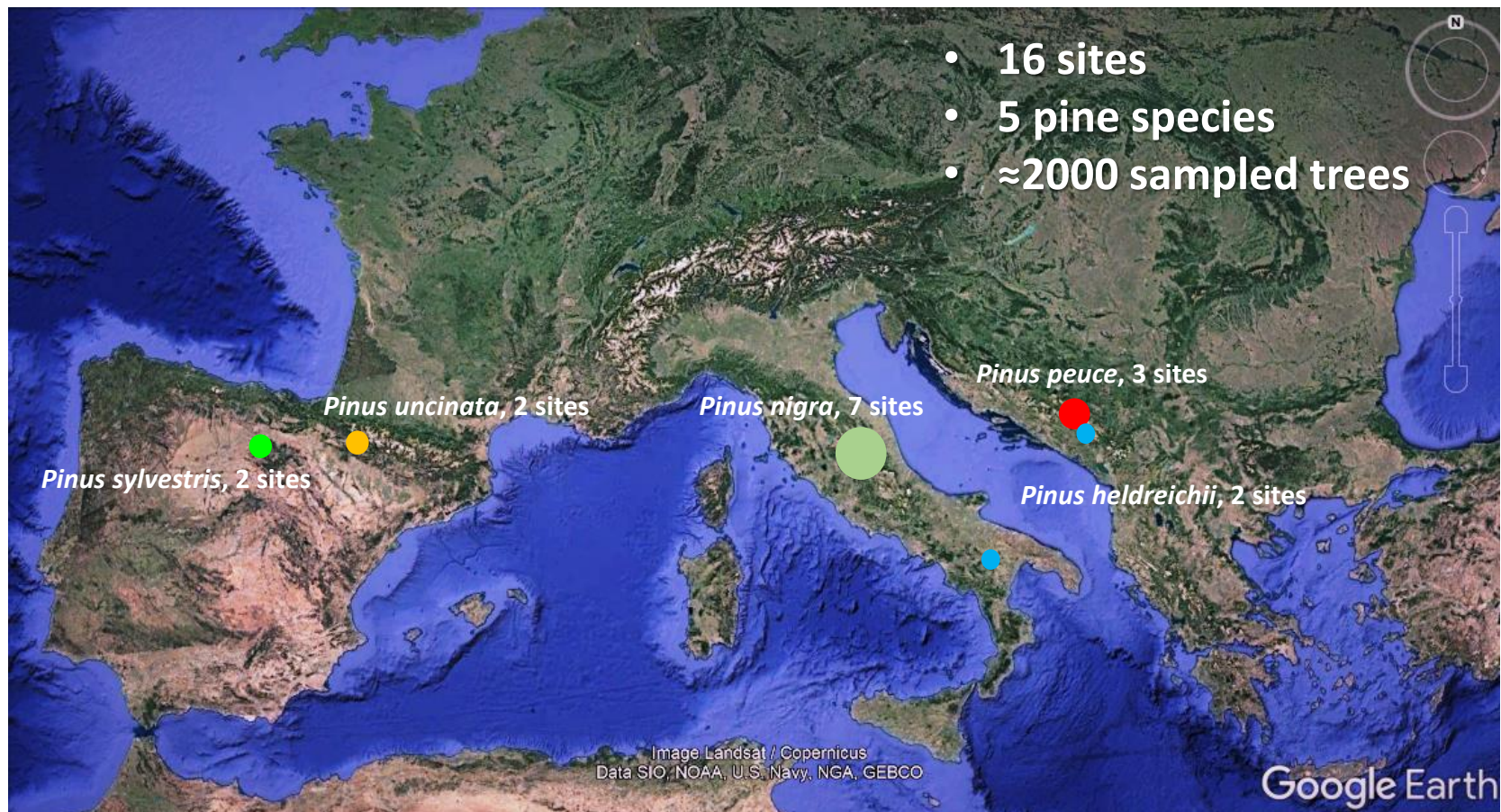
Pinus nigra

Forest dynamics in Mediterranean human-disturbed treeline ecotones

Urbinati, Carlo¹; Vitali, Alessandro¹;
Malandra, Francesco¹; Tonelli, Enrico¹;
Garbarino, Matteo²; Camarero, Julio³

The dataset

4 mountain ranges (Apennines, Dinaric Alps, Pyrenees and Iberian System)



The Apennines treeline ecotone 1.3



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- 1200 km long NW - SE
- 4.4 ° Latitude range
- Severe anthropogenic pressure
 - Deforestation
 - Livestock grazing
 - Extensive slope erosion
 - Forest plantations
- Treeline mean altitude: 1755 m
- Mainly beech forests: 94% **STEADY**
- Localized presence of pine species (*P. nigra*, *P. mugo*, *P. heldreichii*): 6% **DYNAMIC**

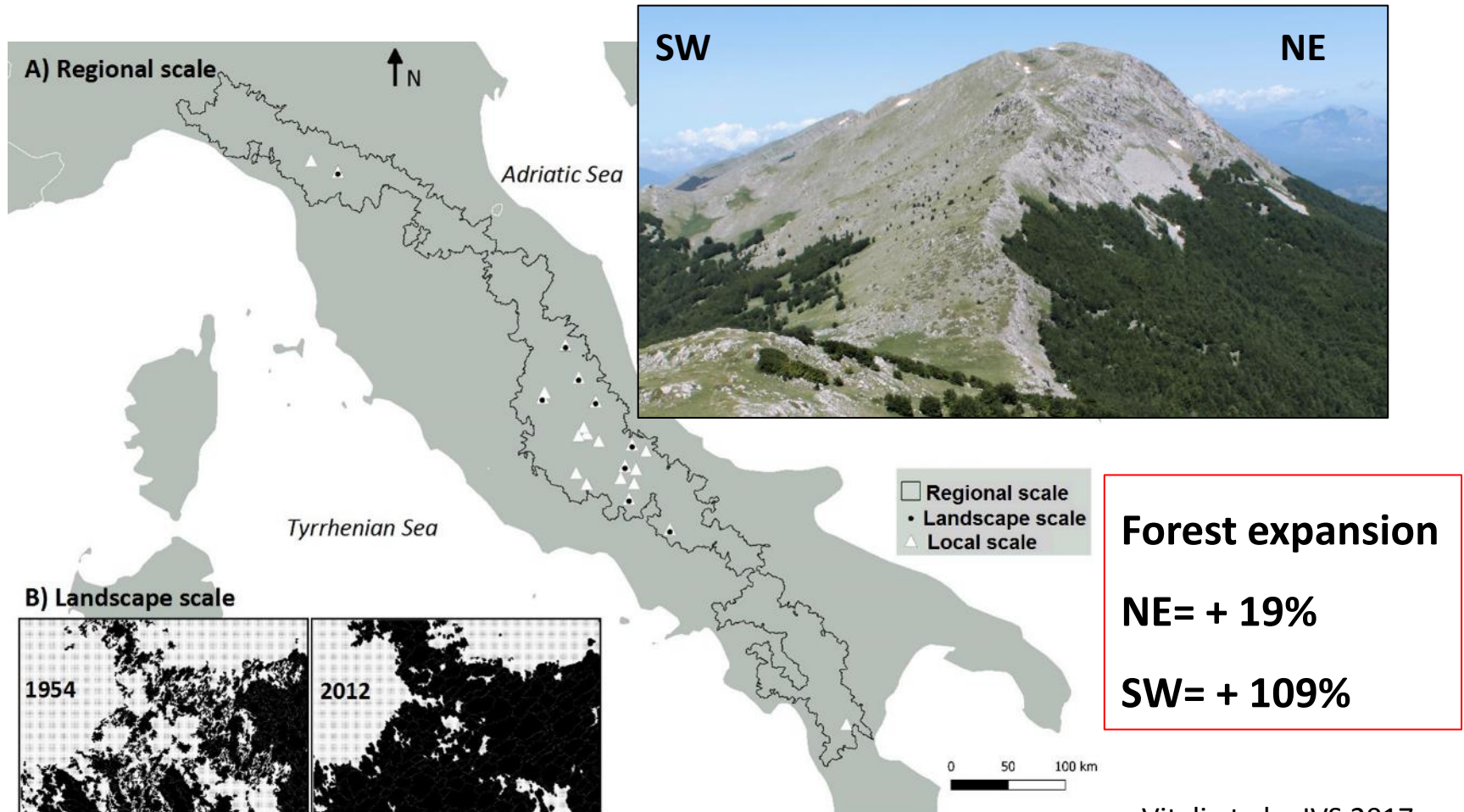


The Apennines treeline ecotone 2.3



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Treeline structure and dynamics drivers are scale dependent



Vitali et al., JVS 2017

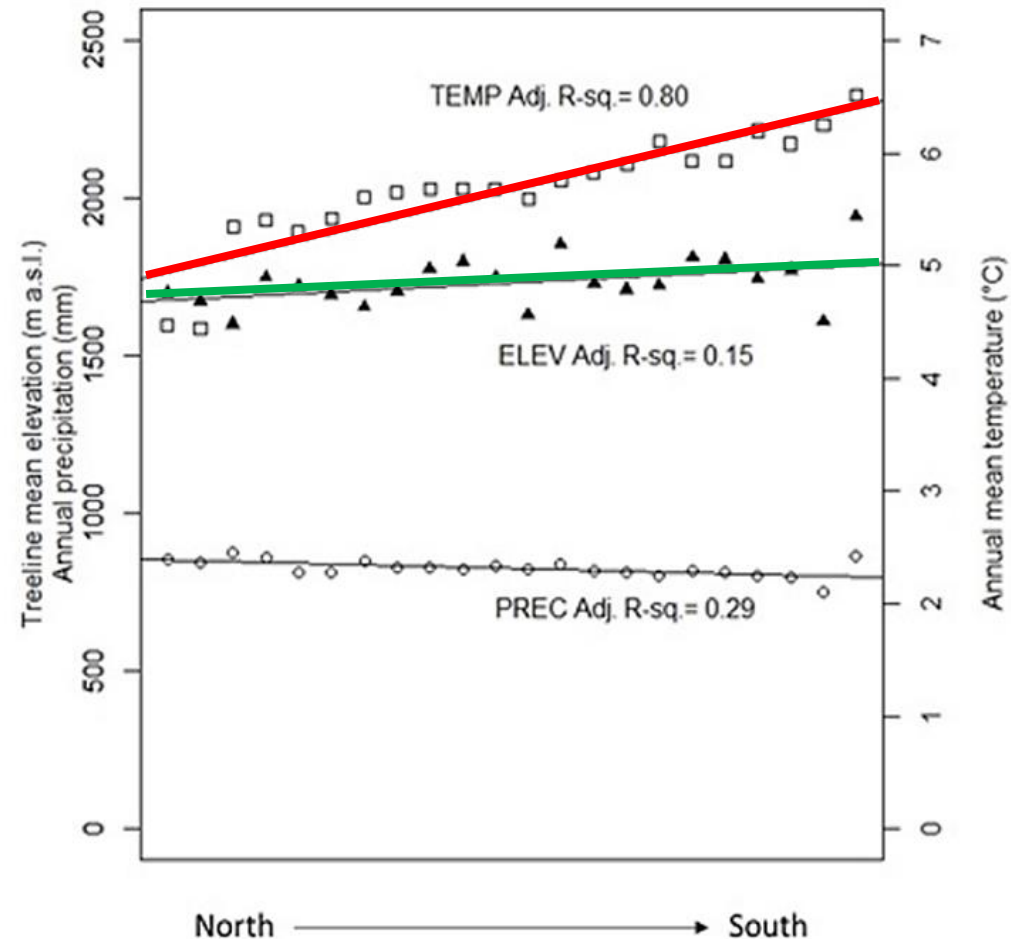
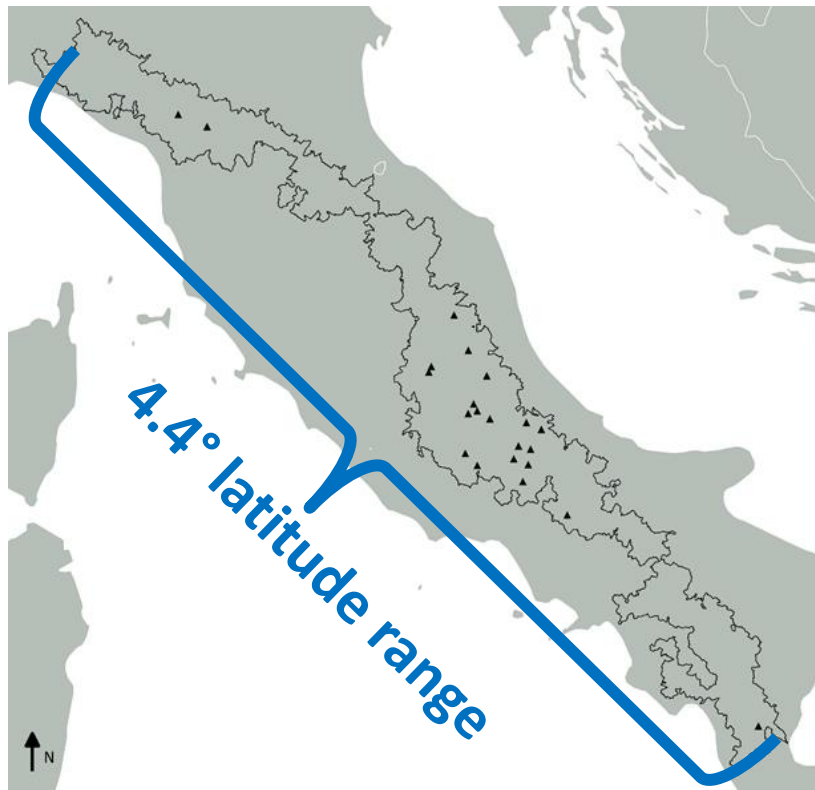
Vitali et al., FEM 2018

The Apennines treeline ecotone 3.3



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- N-S mean annual **temperature** $\Delta = 2^{\circ}\text{C}$
- N-S mean **TL elevation** $\Delta = 243 \text{ m}$ (potential $\Delta = 572 \text{ m}$; Hermes, 1955; Körner, 1998)



The other Mediterranean treelines 1.2

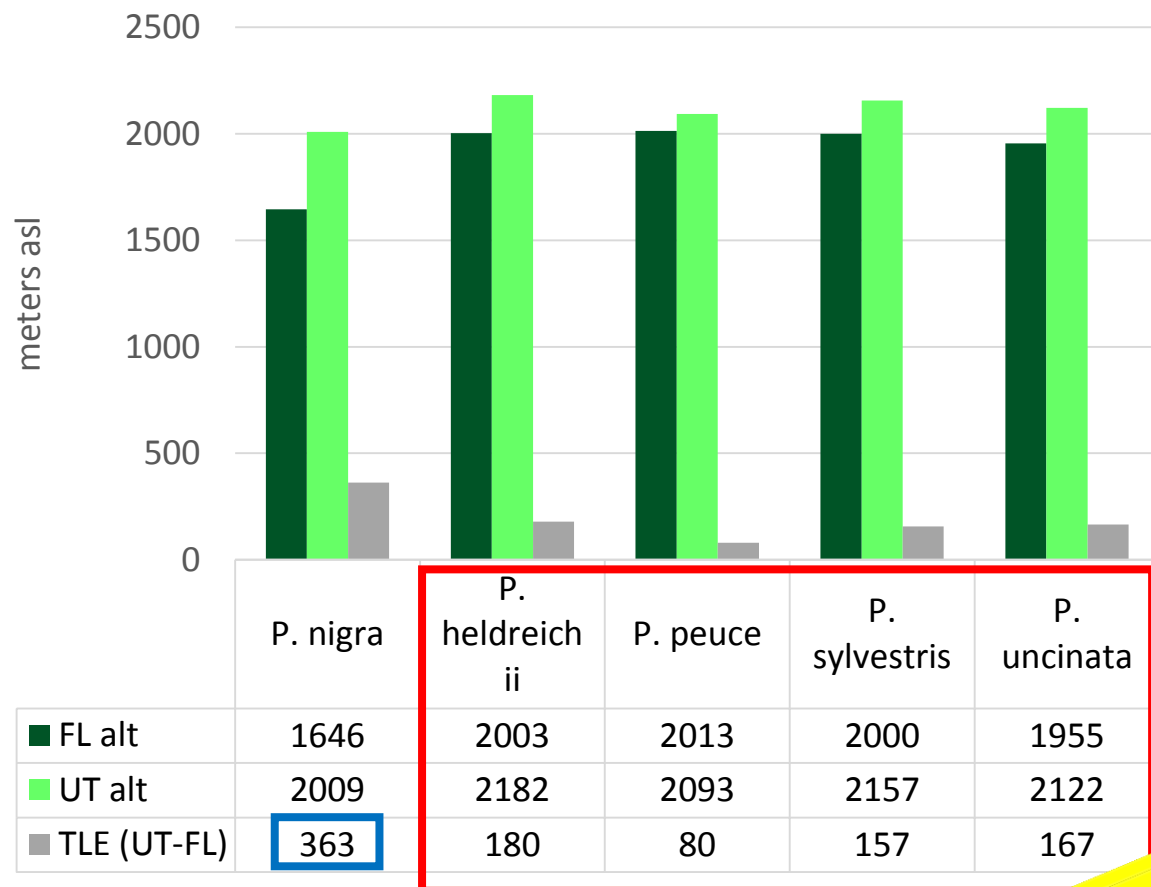


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- Iberian System: *Pinus sylvestris*
- Pyrenees: *Pinus uncinata*
- Dinaric Alps: *Pinus peuce*, *Pinus heldreichii*
- Apennines: *Pinus heldreichii*
- All native species
- Severe anthropogenic pressure
 - Deforestation
 - Livestock grazing
- Different land use history



The other Mediterranean treelines 2.2



FL = Forest line
UT = Upper Tree
TLE = Treeline Ecotone

See poster WS 2.2.A for detailed information

The treeline ecotones dynamics

- Forest infilling/
Treeline upshift
- Synchronic processes
(30-35 years)
- Land-use history
- Topography and micro
habitat
- Seed dispersal
strategies



Effects on (and future research):

- biogeochemical cycles
 - soil properties
 - eco-hydrological processes,
 - biodiversity decline in species-rich grasslands
 - slope protection against land and snow movements
 - risk of wildfires (climate warming)
-



100 years of treeline research

Baumgrenze und Klimacharakter. In: Beiträge zur geobotanischen Landesaufnahme. 255 S. Zürich 1919

Heinrich Brockmann-Jerosch
(1879-1939)



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Thanks for
your attention

Pinus nigra

