



THE LABORATORY OF TREE-RING RESEARCH

presents a talk by

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Pinus nigra encroachment at high altitude in the Central Apennines (Italy)

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Room: Bannister 110

In the central Apennines the treeline is usually composed by *Fagus sylvatica* L. forests located between 1500-1800 m a.s.l., whereas on some other sites it is replaced by extensive black pine plantations to reduce slope-erosion. On one hand the upward shift of beech forests is a very slow or blocked process, on the other black pine natural expansion has been documented well above its altitudinal range of 800 - 1500 m a.s.l. This advancement, similar to a moving treeline, is a recent complex process controlled by synergic factors such as grazing pressure, climate, topography, seed availability, dispersion and germination efficiency. Our research is aimed: to analyze the population dynamics of *Pinus nigra* above the timberline, to detect possible patterns and trajectories of the new cohorts according to some environmental gradient and to discriminate the effect of local factors such as altitude, exposure, microhabitat, distance from timberline and seeds source on tree growth. We selected five areas above the current treeline to investigate the plant age, radial and height increment, health and crown shape indexes and habitat. Basal cores were sampled to measurement ring width and age. Transverse sections for anatomical investigations were prepared to quantify tracheids diameter and cell wall thickness, wood anomalies within tree rings, such as intra-annual density fluctuations. Results showed that, despite the areas differ in slope, altitude and previous land use, the new trees had similar radial and height increment, comparable health and shape indexes. Furthermore the pines have similar temporal distribution: the upward shifting started 30-35 years ago and the maximum peaks was in the '90. Our results confirm the complexity of treeline dynamics, especially where the influence of geomorphology, climate and topography is blended with that of human disturbance, making the disentangling of their individual roles very difficult.