



Project acronym: WoodForce

Project title: Wood formation and carbon balance in forest species growing in cold environments

Project leader: Alessio Giovannelli, Consiglio Nazionale Ricerche (CNR), Rome, Italy

Discipline: Earth Sciences & Environment: Ecosystems & Biodiversity

Station(s): Hyytiälä Forest Research Station (Finland)

The research focuses on the wood formation in boreal forest in a context of changing environment focusing our interest on the latewood formation, the main trait determining wood quality. The aim is to describe the adaptive strategies take in place during growth to dormancy transition phase to warming in *Pinus sylvestris* (porous ring wood) and how these adaptive strategies can influence stem growth and wood quality. We would verify the hypothesis that: 1) the lengthening of the growing season due to warming induce a longer growth to dormancy transition phase of the cambium resulting in a higher amount of structural carbon fixed in the latewood cells and an increase of latewood density; 2) the increase of the latewood density decrease the hydraulic conductivity of the latewood. On the basis of these aims we propose a double approach: a) tree growth climate-relations analysed on the last 7-10 years (last 7-10 woody rings) with the aim to correlate xylem and phloem cell morphology to meteorological parameters at seasonal level; b) sugar analyses and cell wall component of new forming latewood cells through an high temporal and spatial sampling design with the aim to follow carbon balance within the stem during the growth to dormancy transition phase. The experiment will be conducted at Hyytiälä Forestry Research Station (SMEAR II) for the wood sampling and at IVALSA-CNR of Florence for the biochemical and anatomical analyses.