

EFFECT OF SEVERE DROUGHTS ON *PINUS SYLVESTRIS* TRANSPIRATION IN A MONTANE MEDITERRANEAN RESEARCH CATCHMENT (VALLCEBRE, SPAIN)

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The increase of global average temperatures and change in rainfall regimes during this century is expected to enhance the frequency and severity of droughts. These changes will probably be more significant in Mediterranean montane forests, in contrast with temperate ones, as the former are prone to suffer extremely dry periods.

Pinus sylvestris (Scots pine), a tree species with a strict stomatal control of transpiration in response to soil water stress and evaporative demand, dominates the landscape of montane areas in NE Spain. Therefore, a high interannual variability in transpiration and a strong reduction during dry years will be expected in these areas

We analysed the severe droughts occurred during the period 1995- 2006 at the montane Mediterranean research catchments of Vallcebre (Eastern-Pyrenees, Spain). Rainfall and temperature conditions of the studied period were firstly compared to long-term averages to detect climate anomalies. Secondly, drought occurrence, duration and intensity during the studied period were analysed at the daily scale using catchment rainfall, meteorological, soil water content and water table depths records. Finally, the analysis of the effect of soil water availability on measured *P. sylvestris* transpiration, during the vegetative period, was assessed.

Three years (1998, 2000 and 2003) presented a total rainfall amount (vegetative period) 25% below the mean. For these years, soil water stress as an indicator of drought duration lasted for more than 100 days. Under these conditions, Scots pine transpiration was reduced to half the value measured during average years. Scots pine was found to be highly sensitive to soil drought, strongly regulating stomatal aperture in response to high evaporative demand during dry summers.

