

Tree radial growth response to climate: a synthetic study of pointer years in French forests

Vincent V. Badeau, Nathalie Bréda, François F. Lebourgeois, André A. Granier, Jean-Luc Dupouey

▶ **To cite this version:**

Vincent V. Badeau, Nathalie Bréda, François F. Lebourgeois, André A. Granier, Jean-Luc Dupouey. Tree radial growth response to climate: a synthetic study of pointer years in French forests. Impacts of the drought and heat in 2003 on forests. Scientific conference., Nov 2004, Freiburg, Germany. hal-02826595

HAL Id: hal-02826595
https://hal.inrae.fr/hal-02826595

Submitted on 7 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

2.3.6 Tree radial growth response to climate: a synthetic study of pointer years in French forests

V. Badeau, N. Bréda, F. Lebourgeois, A. Granier, J.L. Dupouey

INRA - Research center of Nancy, Forest Ecology & Ecophysiology Unit, F-54280 Champenoux, France

Dendroecological studies began 20 years ago at the Phytoecological Laboratory of the National Agronomic Research Institute in France (INRA). Large surveys have been carried out in several geographical regions and forests allowing the study of radial growth of individual trees during the past 150 years.

This contribution focuses on the analysis of pointer years and summarizes the results obtained for 8 species (*Fagus sylvatica*, *Quercus petraea*, *Quercus robur*, *Fraxinus excelsior*, *Abies alba*, *Pinus uncinata, Pinus sylvestris, Picea abies*) and 12 regions (with an average of 500 analysed trees for each study). This first dataset is supplemented by the data collected on 40 sites and 5 species of the French Permanent Network for the Monitoring of Forest Ecosystems (RENECOFOR – European Network – Level II plots).

The frequency and amplitude of pointer years are discussed according to the species and the sampling areas. A multivariate analysis of the sites x pointer years table allows an ordination of species according to their sensitivity to climatic factors. *Fagus sylvatica* seems to be the most “sensitive” species to inter-annual climatic variations whatever its location and, for the whole sample, regional and species effects are pointed out. The number of pointer years observed in a given stand is strongly correlated with the average site dryness, clearly showing that spatial variations of drought control tree radial growth. We finally analyse the interannual correlation between water stress variations and pointer years.