



International
Conference
on Tree Rings,
Environment,
and Humanity:
Relationships
and Processes



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**International Conference on Tree-Rings, Environment and Humanity
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Dendroclimatology Investigation for the Last 200 to 400 Years in Central Spain

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E. Gutiérrez (Departament d'Ecologia, Facultat de Biologia, Universitat de Barcelona, Av. Diagonal, 645 08028 Barcelona, Spain; e-mail: emilia@porthos.bio.v.ub.es.)

Six chronologies from the Central Range (Spain) (238 to 466 years) and their pointer years were analyzed, in order to assess their potential use for reconstructing climatic variables.

For the climatic comparison three meteorological stations were used: Navacerrada (47 years) with similar altitude to those of the chronologies; Madrid (181 years) and Segovia (87 years), both located at lower altitudes and with different climates. A group of seasonal and monthly climatic variables was reconstructed and evaluated, allowing to establish conclusions for the periods of the chronologies. The results were analyzed from a climatic point of view.

Influence of Canopy gap Size and Other gap Characteristics on the Rate and Success of Regeneration in Coniferous Forests of the Pyrenees

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The regeneration pattern of two pine species was studied in several monospecific forests of *Pinus uncinata* and of *P. sylvestris*, in relation to their degree of shade-tolerance and to disturbances that create gaps.

The results show that the two forest species required gaps for regeneration, which is determined by gap characteristics: gap size and form, area of the expanded gap, and kind of habitats available for the seedlings to grow. The effect of these characteristics on recruitment are discussed in relation to the regeneration rate and success considering the process of canopy openings through dendrochronological methods.

Wood-Anatomical Evidence of Pollarding in Ash Stems From the Valais, Switzerland

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Pollarding of broadleaved trees and leaf-foddering is an agricultural practice existing since prehistoric times in Switzerland. It was therefore expected, that the impact of pollarding on the wood structure could be detected. The formation of a second ring of earlywood pores in the latewood of the pollarding year, combined with a reduced cell wall thickening in the latewood could be shown for pollarded ash trees (*Fraxinus excelsior* L.) from the Swiss canton Valais. By using this wood-anatomical characteristics pollarding may be identified in contemporary and prehistoric ash stems, and may give an important contribution to the reconstruction of agricultural history.

Reconstruction of Climatic Changes During the Holocene Based on Tree-Ring Data From the North of Western Siberia.

R. M. Hantemirov, S. G. Shiyatov and A. Y. Surkov (Institute of Plant and Animal Ecology, Ural Division of the Russian Academy of Sciences, 8 Marta Street 202, Ekaterinburg 620219, Russia; 3432-40-80; e-mail: plant@insec.quorus.e-burg.su)

There is considerable recent and old tree wood material preserved in the Holocene deposits in the North of Western Siberia (67-68°N, 70°E). This allows the possibility to build multi-millennial length tree-ring chronologies. Dating of such wood by the radiocarbon technique has shown that the age of the oldest subfossil wood remains reaches 8500 years.

Currently, about 1000 cuts of subfossil wood and circa 150 bores and cuts from old living trees (*Larix sibirica* and *Picea obovata*) have been obtained. An absolute chronology has been developed for the last 900 years. Additionally, about 50 floating chronologies, including maximum latewood density chronologies, of 150-350 years duration also have been developed.

Effects of Municipal Wastewater on Cypress Productivity in a Louisiana Swamp

I. D. Hesse and J. W. Day (Center for Wetland Resources, Louisiana State University, Baton Rouge, LA 70803, USA; 504-388-6092; e-mail: ceigrp@lsuvax.sncc.lsu.edu)
T. W. Doyle (National Wetlands Research Center, 700 Cajundome Blvd., Lafayette, LA 70506, USA; 318-266-8647; e-mail: doylet@nwrcc.gov)

The use of natural and constructed wetlands for tertiary treatment of wastewater is receiving much attention for potential benefits of improving water quality and enhancing ecosystem productivity. In this study, we reviewed a 70-year growth history of overstory baldcypress in a swamp near Breaux Bridge, Louisiana that has received municipal effluent over the last 30 years. Growth chronologies were developed from dated core samples taken from a treated and control site in the same drainage system above and below the treatment plant. Differences in growth response between treatment sites showed no consistent pattern of growth enhancement or decline relative to effluent discharge. The treated site, however, did show less sensitivity to drought. These findings offer a baseline for evaluating the effects of chronic and long-term application of treated effluent on the health and productivity of forested swamp ecosystems.

Tree-Ring Research at Windsor Castle, England

J. Hillam and C. G. Groves (both at: Sheffield Dendrochronology Laboratory, Department of Archaeology & Prehistory, The University of Sheffield, Sheffield S10 1TN, England; 044 742 826084, e-mail: J.Hillam@sheffield.ac.uk)

The tree-ring project, initiated after the fire at Windsor Castle in 1992, is described. Although the salvage and dating of the medieval and post-medieval timbers were the immediate aims of the study, the research has been broadened to cover all aspects of timber usage at Windsor. First, the dating of the oak timbers from the fire-damaged areas was undertaken, followed by the analysis, dating and provenance of the post-medieval conifers. Lastly, the study will look at some of the living trees in the Great Park, source of many of the oak timbers.

Application of Synoptic Climatology to Spatial Tree-Ring Patterns: An Example Using Frost Rings as Signatures of Short-Term Extreme Events

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Regional frost ring occurrence at midlatitude sites is one of the few measurable tree-ring parameters that can be linked directly to a set of specific weather conditions, i.e., a short-term unseasonal outbreak of polar air during the growing season. Such conditions almost certainly are produced by a unique signature in the atmospheric circulation: a deep mid-tropospheric trough, often associated with blocking activity in the large-scale circulation. In this paper synoptic climatology is used to provide a process-based explanatory framework for spatial patterns of regional frost ring occurrence in subalpine bristlecone pines in western United States.

Dendrochronology And Study Of Roof-Framing In Belgium And North Of France

P. Hoffsummer (Laboratoire de dendrochronologie, Université de Liège, place du 20 août 7, B-4000 Liège, Belgium)

Our researches are following different objectives. The most important of them is the use of tree-ring dating in the study of medieval and post-medieval monuments. The evolution of roof-framing and carpentry (from 11th century to 19th century) in Belgium and North of France is our speciality. We also offer dating service for archaeologists.

The master-chronologies we used first were the german chronologies but now we have a regional oak chronology (672 A.D. to 1991 AD) for south of Belgium and we are building other curves for North of France in collaboration with Georges Lambert (C.N.R.S., University of Besançon in France).

Can Tree Ring Analysis be a Useful Tool in Environmental Impact Assessment Studies? - Results From Case Studies in Germany Reveal a Clear "Yes" Under Certain Conditions

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The validity of tree ring analysis was proved in two case studies in Germany by known major industrial pollution incidents. The results reveal that these events are exactly reflected in the elemental concentration of tree rings. The character of elemental accumulation in tree rings shows up to be on a true biological effect level with evidence of influencing factors. The combined analysis of bioaccumulation in tree rings and their width, as an indicator for vitality, allows further conclusions on the limits of elasticity in a major compartment of the ecosystem. Criteria for a valid application of tree ring analysis in EIAs are discussed.

Dendrochronology in the Derbyshire Peaks, England, and its Application to the Region's Present Environment and Future Cultural Process.

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The Derbyshire Peaks of England form an area of natural beauty. The region has been established as a National Park with the buildings being protected by conservation regulations. While a downturn in agricultural economics has increased abandonment and decay, an increase in real estate values and tourism has encouraged the conversion of farm buildings for alternate use. Dating by dendrochronology indicates the frequency or rarity, and thus importance, of certain building types. If the present environment is to be maintained and future culture processes managed, research on the buildings must be undertaken to facilitate best planning for the future.

The Case of the Tree Ring Date for the Thera Eruption and Its Interpretation.

J. D. Hughes (University of Denver, Department of History, Denver, CO 80208; Tel. 303-871-2952, FAX 303-871-2957; E-mail: dhughes@du.edu).

The eruption of the island volcano, Thera, in the Aegean Sea, has been cited by historians to explain the downfall of Minoan civilization. It has even been credited as the event that gave rise to the myth of lost Atlantis. These theories comported well with a date for the explosion between 1500 and 1450 BC, which was consistent with radiocarbon dating and archaeological context. In the last decade, tree ring dates from two sources in the range of 1626-1624 BC offered evidence against these correlations, and have been supported by recalibration of radiocarbon dates. Many historians now recognize the need for a far-reaching revision of Bronze Age Aegean chronology. But the necessary rethinking was long in coming due to the "great divide" in academia which separates historians and classicists from their scientific colleagues.

**Reconstruction of Climatic Changes During the
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R. M. Hantemirov, S. G. Shiyatov and A. Y. Surkov
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