Geophysical Research Abstracts
Vol. 20, EGU2018-8005, 2018
EGU General Assembly 2018

A new approach to dendrochronological dating using the intra-annual characteristics of the oak tree-ring

Constantin Nechita

National Research and Development Institute for Silviculture "Marin Dracea" (INCDS), Biometry, Romania (nechitadendro@gmail.com)

KEY WORDS: Oak, Maramures, Monasteries, Tree-Rings, Crossdating

In this paper was analyzed the possibility of maximizing the precision of dendrochronological dating using the width of the latewood ring. Starting from year 1997 until present a sustained work completed with formation of a 611 -years oak tree-rings chronology developed in Romania, summarizing 391 samples from living trees and 455 of archaeological wood. All 846 samples were chosen from a much more number using some criteria such as the best match and the length of individual tree-ring series. Several issues have appeared in the process of crossdating, due the geoclimatic conditions that determine particularities that determine different characteristics of microregional tree-ring growth. In this way I tried several ways to increase the accuracy of dendrochronological dating process. Using this dataset, we cossdating at the beginning samples using annual ring, so an average number of 133 samples from living trees and only 138 of archaeological wood were able to position themselves with precision, meaning 32% from all samples. The reasoning used assume the separation of information into two variables, conditioned mostly by different factors, to test whether the samples that did not crossdate with TRW can be dated with significant correlation using one of intra-annual variables, respectively earlywood (EW) and latewood (LW). Testing the EW tree ring series, we obtained a less number of samples dated and less significant correlation. Instead, by using only the width of the latewood ring, the number of accurately dated samples increased to 58%. The result obtained will be further tested on other sets of data to identify possible limitations of the approach.

This work was supported by a grant from the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI–UEFISCDI, project number PN-III-P2-2.1-PED-2016-1058, within PNCDI III “A new technique regarding dendrochronological dating. Statistical, biological and chemical approach” (DendroTECH).