THE ULTIMATE RCS MODELLING METHOD

Validity and reliability. A common task in dendrochronology is to identify climatic events from tree-rings. The many environ-mental factors affecting simultaneously to tree-growth, however, may make the task difficult. To minimise the problem, a good plan for the whole process of investigation is necessary. Cook’s conceptual aggregate growth model provides a good framework model for planning. We just need to arm the model with the proper data and methodological “proper” means high significance in both dimensions of validity and reliability (V&R). We have also to be very careful and strict in drawing the proper conclusions.

Power Data. Maximising V&R presupposes careful preparing of data. This concerns especially the data sensitive methods like RCS (Regional Curve Standardisation). Applying pre-qualified criteria in sampling gains a smaller sample size and better data quality. Proper sample size depends on the desired accuracy level and the investigated topic. The coefficient of variation (CV) of tree-ring

40-50%. Requesting a 10% accuracy in the index at 5% risk, counts at least 50 observation per year. A data preparation tool called “the Box Filling Method” (BFM), introduced by the authors, provides some criteria for producing evenly distributed datasets defined by calendar year and cambium age. BFM can also generate several independent or depend-ent substrata from a larger dataset.

Proper Methodology. There are two methods of exposing climatic signals: Single Tree Stand-ardisation (STS) and Regional Curve Standard-isation (RCS). STS fits well for identifying annual and decadal variation whilst RCS is used for exposing long trends.

In order to gain maximum V&R, RCS should always fulfill both the pre-qualified and the BFM criteria. If BFM fails, RCS should not at all be applied to dendroclimatic analyses!

Proper conclusions. How to generalize the results? Small datasets often represent only the local climatic conditions. But the conclusions would even in this case be biased.

POWER USE OF TREE-RING DATA

Modeling techniques in tree-ring science, thanks to Fritts, Hess, Briffa, Stagno and others, are highly developed and there maybe is not much to add. But the way we collect and use tree-ring data, needs much more attention.

A Foramin program called SAMPLER is a tool for mining new datasets from large databases. A奉献 program named SAMPLER, which generates homogenous datasets for RCS modelling scenarios. The program also includes the following parameters (example answers follow):

1. Define study area
2. Define calendar period
3. Select sample tree
4. Classify and standardize
5. Residuals
6. Randomizing
7. Data sample (split into independent and dependent datasets)
8. Data output

The program is designed to be used in RCS analysis and it has 7 statistical description files for data qualifying. Running with those parameters would produce fully randomised and independent data sets.