a) entering accompanying information;

b) digital image processing of wood samples and improving their properties (filtering, enhancement, contrast, brightness, inversion, etc.);

c) automatically detecting of tree layers (in addition to ring widths, other features such as early wood and late wood can also be measured and recorded);

It has been shown that accurate representations of tree layer boundaries can be created with a high degree of accuracy. But in many cases, it is still desirable to retain the option of specialist intervention during the process.

d) cross-dating of time series (for verification of series and the elimination of possible errors and to find the correct dated position in time).

e) statistical data processing (t-statistic for correlation significance and a special tools for cross-dating of tree-ring series);

f) various visualization of the results;

g) building various specialized and personalized data bank for analysis which contain tree layer data as well as their documentation and spatial information.

In summary, a prototype of the automated workplace for dendrochronological information processing has been developed. It is useful tool for dendrochronological investigations. The time spent calculating the width of a tree layer using AW "DendroExp" is significantly less than the time required by the manual measurement.

Khokh A.[1], Rubinchik S.[2], Kuzmenkov D.[2]

[1]International Sakharov Environmental Institute of Belarusian State University; Minsk, Republic of Belarus;

[2]Scientific and Practical Centre of the State Committee of Forensic Expertises, Minsk, Republic of Belarus

RADIAL GROWTH OF SCOTS PINE ON SOILS OF INSUFFICIENT, MODERATE AND HIGH MOISTENING

Tree growth can be influenced by a wide-variety of abiotic and biotic factors. Certain factors influencing tree growth may be very local in effect. It is well established that local soil condition determine growth of forest ecosystems. The width of a tree layer shows the amount of growth that has taken place during one year and thus indicates the growing conditions for that year. When the conditions are good the tree grows faster and so lays down more tissue in the year, resulting in a wider growth layer. Poor conditions mean slower growth, less tissue laid down and consequently a narrower layer.

The purpose of our research was to reveal laws of formation of pine radial-growth in contrast forest types on soils of insufficient, moderate and high moistening and factors determining this process. The objects of the research were pine trees of the Berezinsky biosphere reserve. The trees we used as samples are relatively old trees, 95–150 years old, 16–27 meters high. Wood samples were taken in six plots. Forest types are *Pinelum claditiosuinm* (chronology № 1), *Pinetum pieridiosum* (chronology № 2), *Pinetum oxalidosum* (chronology № 3), *Pinetum polytrichosum* (chronology № 4), *Pinetum ledosum* (chronology № 5) and *Pinetum sphagnosum* (chronology № 6). Two cores were taken from 20 pine trees in each plot. The annual layers width was measured with LINTAB 6 measuring system to the nearest 0,01 mm. The tree-ring series were cross-dated and standardized by using the corresponding software TSAP-Win Scientific (Rinn 2003).

Our results show that all tree-ring chronologies (TRC) have high interserial of coefficients correlation/correlation between individual series (0,67–0,74) that speaks about existence of well-expressed external factors which are revealed similar dynamics of an annual increment of all trees. Since the trees are of the same species and all grew under similar conditions the tree layers are expected to be the same distance apart in the same year.

Moreover, all TRC have high coefficient of sensitivity. The sensitivity of №5 and №6 tree-ring chronologies is a bit higher than № 1–4 chronologies. It is explained that two first chronologies are formed in extreme conditions on the soil by high moistening.

All tree-ring chronologies except № 1–2 have high autocorrelation of first order. A high autocorrelation shows that increment of pine trees is connected with variability of the external factors. A small coefficient of the autocorrelation of first order in № 1–2 chronologies is connected with impact of other internal factors which cause long stable decrease or increase of increment.

Correlation between chronologies is decreased with growth of distance between them in the soil moisture time series. A high correlation is observed between the trees in the plot № 1 and № 2, communication – in the soil and groundwater conditions. A sufficient positive correlation coefficient is observed for № 4 and № 5 chronologies. Correlation between № 1 (*Pinelum claditiosuinm*) and № 6 (*Pinetum sphagnosum*) chronologies totally absent.

Analysis of the negative pointer years showed that unfavorable years for tree growth were: 1914, 1940, 1971 and 1979 for *Pinelum claditiosuinm*, *Pinetum pieridiosum* and *Pinetum oxalidosum;* 1914, 1917, 1947, 1979 and 1993 for *Pinetum polytrichosum, Pinetum ledosum;* 1925, 1930, 1934, 1957 and 1971 for *Pinetum sphagnosum.*

Thus, results showed that each forest type is different from other in amplitude and nature of the variability of the width of tree layers. The most sensitive to external influences are sphagnum pine forests. These results may therefore be valuable for the forensic expert practice to establish tospecify terrain and tree site conditions and to identify the terrain compartment where the analyzed trees have grown.