The use of these systems allows you to protect nuclear power plants against the effects of natural and technogenic character, and also incorrect actions of personnel in emergency situations.

Khokh A.[1], 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*

CREATION OF THE AUTOMATED WORKPLACE "DENDROEXP" ON PROCESSING OF DENDROCHRONOLOGICAL INFORMATION

The issues involved in the detection and analysis of tree layers are not unique to the application, but are likely of interest to anyone developing automated image analysis systems.

At present, tree layers are becoming increasingly critical for understanding the nature of past environmental variability, and how it may change in the future. They are frequently analyzed by foresters, forensic experts, ecologists and botanists. The purpose of the analysis is usually to evaluate the growth of trees or their growth patterns. Growth patterns are analyzed to determine trends in the climate by using the inverse relationship of growth to climate. To date, extracting information from these is consuming and tedious task. Many hours of tedious work by experts in dendrochronology are required to accurately analyze each tree ring sample. This applies even when sophisticated detectors are used to make basic measurements, since great care must be taken in stringing series of measurements together into very long time series whilst retaining all information that might turn out to be useful later in the analysis. Existing image-analysis software alone cannot solve this problem. The labor-intensive analysis that these records require has created a strong incentive to develop instrumentation that can be used to process samples more efficiently, and with more interpretive power than is available from off-the- shelf image processing software. So, development automated workplace (AW) for dendrochronological information processing was very relevant.

The automated workplace "DendroExp" was created by the Scientific and Practical Center of Forensic Expertise of the Committee State of the Republic of Belarus to accurately and efficiently measure of tree layers. An image analysis system for measuring is required if large numbers of wood samples are to be analyzed efficiently. AW "DendroExp" is based in recent advances in dendrocomputer technology and consists of two parts:

1) server part that stores information in the Sybase Adaptive Server Anywhere 9.0;

2) client part that implement a number of key functions:

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