

## Working project title:

" Dendrochronological analyzes for climate changes in South East Europe (SEE)"

### ***WORK PACKAGE 1 - Dendroclimatological investigation and regional climate reconstruction in South East Europe (SEE)***

The climate change assessment will be done through dendrochronological analyses of tree rings from *Quercus sp.*, *Fagus spp.*, *Pinus spp.*, *Picea spp.*, *Abies spp.* etc. in SEE. In order to achieve the purpose the following research tasks have been formulated:

- Study, measurement and standardizing of long term radial growth chronologies of representative tree species in SEE.;
- Removing the auto regression effect within the mean standardized sequence;
- Expressing the mean standardized sequence as a function of monthly air temperatures and precipitations by step wise regression for the last years;
- Reconstruction of monthly air temperatures and precipitations by finding correlation between them and tree ring indices;
- Spectral analysis to reveal the periodicities of the reconstructed monthly air temperatures and precipitations.

### ***WORK PACKAGE 2 - Creating models of climate changes in SEE***

Past, present and future climate changes will be analyzed based on available data and on climate projections to fulfill the need of local and regional impact assessment. The climate projections will be based on General Circulation Models (GCMs) and Limited Atmospheric Models (LAMs), assuming prescribed changes in atmospheric composition and forcing. Various statistical techniques will be used to downscale the GCMs and LAMs atmospheric data.

### ***WORK PACKAGE 3 - Dendrochronological research and evaluation of non-climatic impact on determined growth models and regional climate in SEE***

Or *Assessment of indirect influence on determined growth models and regional climate in SEE*

- Analyses of heavy metals content in the wood distributed by yearly tree rings;
- Computing of average heavy metals content in the wood of model trees;
- Analyses of other organic and non-organic pollutants and their influence on radial growth;
- Analyses of other human factors on radial growth;
- Analyses of the influence of other non-climatic and non-human ecological factors – biotical and non biotical on radial growth;

- Statistical processing of data acquired from dendroecology research using statistical software. The statistical processing includes standardization and calibration of sample sequences;
- Analyses of critical periods (periods with decreased radial growth). The main objective is to discover common time period for the species from the same genera having impact on growing;
- Correlation analyses of these results with the results invented stress periods for model samples according to yearly tree rings growth and also with climatic data.
- Assessment influence of non-climatic factors on the tree growth.
- Preparation of simulation prognostics of non-climatic factors influence over forest ecosystems and climate.

***WORK PACKAGE 4 - Development of web based database for storage of climate related information***

The proposed system will be used for storing climate related data. The knowledge base for climate reconstruction and prognostics is rapidly growing. In this reason the proposed database have to fulfill the following conditions:

- Extendibility of stored data types at user level. This means that users will be supplied with following possibilities:
  - Creating own categories without necessity for redesign of database;
  - Creating hierarchically organization of categories;
  - Storing data related with categories;
  - Aggregating data on different hierarchy levels;
  - Supplying time and place dimensions of data stored in order to build time sequences for different places;

In this approach users will be given features to define different climate proxies - tree rings, pollens, bore holes, sediments etc.

- Conversion of proxy dependent data to model dependent data.
- Extendibility of volume of data stored.
- Data replication.