

Trees are archives of climatic and environmental parameters. Each tree ring is like a time capsule that recorded these parameters during the year of its formation. Dendrochronologists are able to prescribe calendar date to each radial increment. Rings of trees of specific species, growing in specific region, recording environmental parameters create common growth pattern – sequence of consecutive wide and narrow rings characteristic for certain time period. This property of trees is used to build chronologies for specific species and region. Tree ring chronologies are used in wide range of disciplines from dating wooden archeological artifacts to paleoclimatic reconstructions. Classical dendrochronological approach uses tree ring as a whole, expressed as the thickness of wood layer deposited in specific year, being a derivative of climatic conditions. Proposed project plans to take dendroclimatic reconstructions to the higher level of time resolution, extracting intraannual climatic signal from dimensional parameters of wood cells. Another exceptional aspect of the project is the fact that the analyses will be performed on one of the most extraordinary organisms on earth - north American Bristlecone Pine. Bristlecone Pine is the longest living organism on earth frequently exceeding the age of 4000 years, and continuous chronologies for that species extended based on subfossil wood cover more than 7000 years. That creates possibility of climatic reconstructions of exceptional length. Planned investigation is possible thanks to established collaboration with Laboratory of Tree Ring Research, University of Arizona in Tucson (USA). That laboratory is the birthplace of modern dendrochronology and houses the greatest wood collection in the world including specimens of Bristlecone Pine, whose exceptional longevity was discovered by scientists from this laboratory. Since that time the LTRR is the best research center for that species. Collaboration with the scientists from LTRR enhances the prestigious aspect of proposed research project.