

## **Dendroclimatic investigation of Calabrian Pine (*Pinus brutia* Ten.) from Mersin region in Turkey**

**Jernej Jevšenak, Slovenian Forestry Institute, Slovenia**  
**Visiting Artvin Coruh University, Faculty of Forestry, Turkey**

Calabrian pine (*Pinus brutia* Ten.) is mainly present on the eastern coast of the Mediterranean, where the tree is an economically important conifer species. However, there is little known about key factors related to its radial growth. The main purpose of my SSV is to apply dendroclimatological procedure to samples of Calabrian pine from Mersin region in Southern Turkey. Those samples were previously used to develop biomass equations<sup>1</sup>, site indexes<sup>2,3</sup> and yield tables<sup>4</sup>, but the information about key climate variables related to variability of radial growth remained unexplored. The understanding of climate-growth relationships is important in terms of warming climate and its effect on tree growth and forest resilience in general.

To analyse climate-growth relationships of Calabrian pine, already collected cores will be used. Research team from Artvin Coruh University, Faculty of Forestry collected approximately 200 cores in years between 2013 and 2015 from Mersin region in Southern Turkey. 30 of the oldest cores from higher elevation will be used to analyse climate-growth relationship. Firstly, tree cores will be sanded to a high polish in the dendrochronological laboratory at the Artvin Coruh University, Forest Faculty. Then, cores will be mounted in wooden holders and later scanned with high resolution optical scanner. Ring widths will be measured using WinDendro software (Regent Instruments Inc.) and individual chronologies will be visually cross-dated and potential errors will be identified with the COFECHA programme. Finally, individual chronologies will be detrended to remove non-climatic influences and averaged to obtain mean site chronologies, which will be later used to analyse climate-growth relationships. Climate-growth relationships will be analysed for monthly and daily mean air temperature and precipitation data. Climate data will be downloaded from KNMI Climate explorer (<https://climexp.knmi.nl/start.cgi>), where gridded monthly and daily data is available. Using the derived statistical relationship, climate variables will be reconstructed back in time using linear and nonlinear machine learning techniques.

The results of our work will be published in peer-reviewed scientific journal. In addition, we plan to present our results at domestic and international conferences in 2020. As a result of this SSV, enhanced long-term cooperation will be established between Slovenian Forestry Institute and Forest Faculty, Artvin Coruh University.

<sup>1</sup>Sönmez, T., Karhiman, A., Şahin, A., Yavuz, M., 2016. Biomass equations for calabrian pine in the mediterranean region of Turkey, *Şumarski list* 140, 567-576

<sup>2</sup>Kahrman, A., Sönmez, T., Gadow, K.v., 2018b. Site index models for Calabrian pine in the central Mediterranean region of Turkey, *Journal of Sustainable Forestry* 37, 459-474.

<sup>3</sup>Kahrman, A., Şahin, A., Sönmez, T., Yavuz, M., 2018a. A novel approach to selecting a competition index: the effect of competition on individual-tree diameter growth of Calabrian pine, *Can. J. For. Res.* 48, 1217-1226.

<sup>4</sup>Şahin, A., Kahrman, A., Yavuz, M., Sönmez, T., 2016. The Statistical Investigation of Stand Type Discrimination of Pure Calabrian Pine Forests in Antalya and Mersin Region of Turkey, *International Forestry Symposium, Kastamonu, Turkey*, pp. 481-489.