# **Trends of Average Tree Defoliation on Bioindication Sample Plots Level I in Serbia**

Češljar G., Đorđević I., Rakonjac Lj., Stefanović T., Gagić - Serdar R., Momirović N.

# Introduction

This research shows the results of monitoring of forests in Serbia in the period 2004-2017. On the basis of the collected data until now, trends of average defoliation are summarized in the case for broadleaves and conifers, as well as for certain types of trees.

### Study area



## Results

Within beech (0,7%) and other broadleaves (1,1%), is present positive exponential growth rate, while within other broadleaves trees hungarian oak (-7,5%), records highest negative exponential growth rate. On the other side, within all conifer types are present negative exponential growth rates, and this is especially evident with scots pine (-5,5%). Observing years with highest average defoliation for all types of trees, 2004 (15,0%)and 2005 (14,4%), are separated with the highest values, while the lowest values are present during 2011 (9,9%) and 2017 (9,6%). Also, by analysing obtained results, it can be noticed that most of the species, records significant rise in 2007, 2013 and 2016, from up to then recorded average defoliations.



#### Trends of average tree defoliations in Serbia (2004-2017)

# Conclusion

Despite negative exponential growth rates in most tree species, specific deviations of average defoliations in some years, can give us guidelines for research and finding possible reasons for this (*Češljar et al., 2014*). In Serbia, mentioned years are recorded as extreme hot and dry, which may indicate that trees, in terms of defoliations, reacted most on the influence of abiotic stress factor, in this case because of high temperatures and lack of precipitation over long period of time, which was very present in mentioned years (*Češljar et al., 2013*).

# References

# Methods

The statistical method is used in the process of analyses of defoliation, and in narrow sense, method of trend analysis. In order to monitor the trends of defoliation, statistical techniques based on the analysis of time series are used (*Đorđević et al.*, 2013).

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