

COMPARISON OF VARIOUS DESCRIPTORS OF TREE VITALITY – A CASE STUDY OF A BEECH INTENSIVE MONITORING PLOT IN CROATIA

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GOAL OF THE STUDY

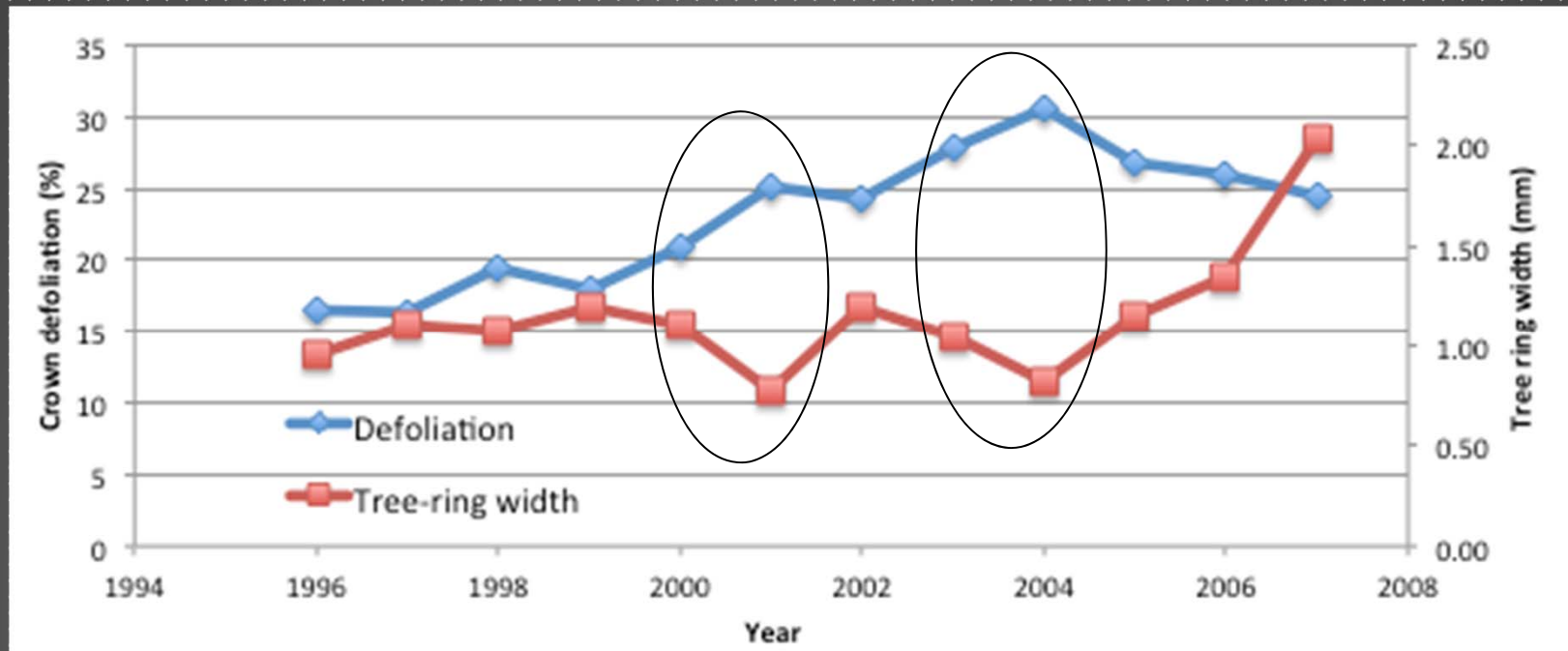
- ▶ **to check the validity and sensitivity of various descriptors of beech vitality as well as their possible interrelations and dependencies on climatic conditions.**

Not on permanently stressed sites but in normal site conditions where increase in temperature and decrease in precipitation might have a negative effect on system functioning, site productivity and tree growth.

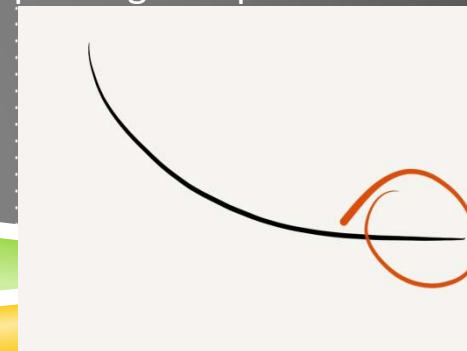
MATERIAL, METHODS, LOCATION

- ▶ Study stand *Sljeme*, ICP Forests Level II plot 103– elevation 1033 m a.s.l.
- ▶ mature, healthy, stable beech stand with moderate average defoliation,
- ▶ data on crown defoliation, foliar composition, soil properties
- ▶ cores from 26 trees for dendrochronological analysis, standardised with ARSTAN, residuals used in the analysis
- ▶ meteorological data from the nearby meteorological station and CRU TS 0.5x0.5° gridded climate data set
- ▶ data were compared for the period 1994 – 2007.

I - CROWN DEFOLIATION & TRW

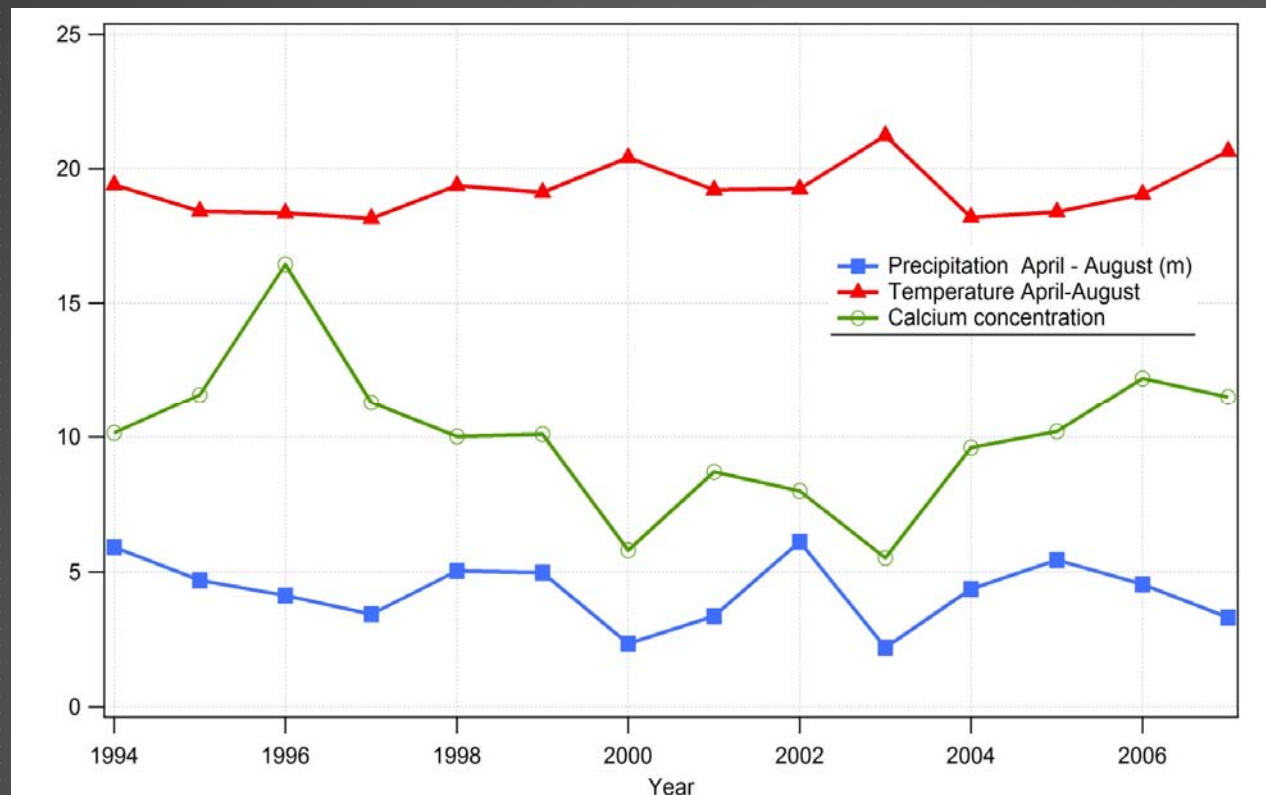


TRW and defoliation – immediate response (in the same year) + prolonged response of defoliation and TRW following a drought year!



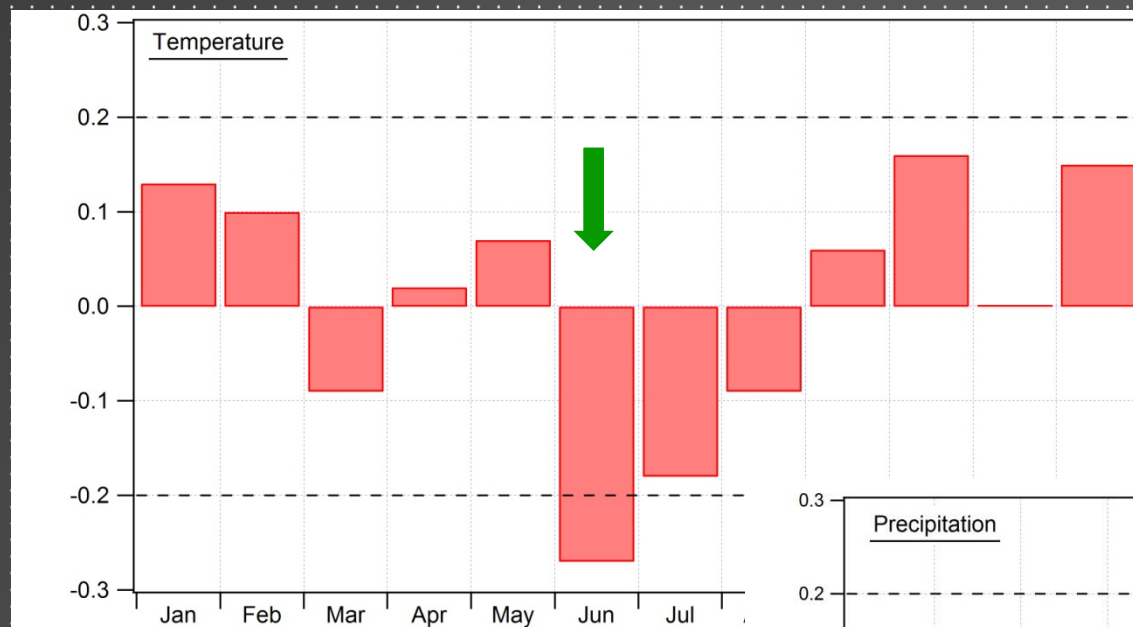
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2 - CLIMATE & MINERAL NUTRITION

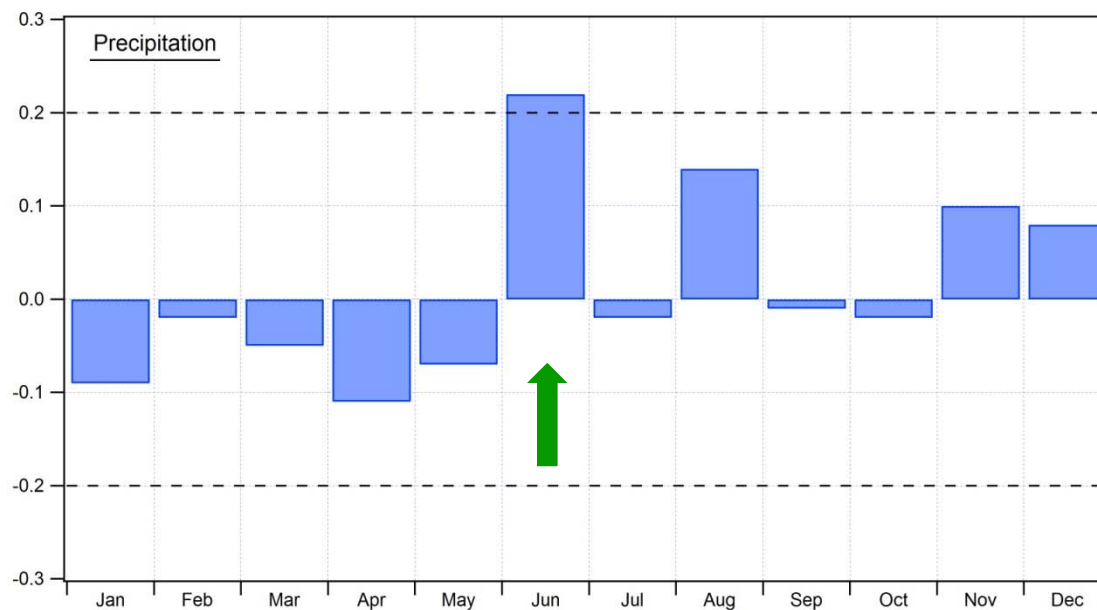


The results of regression analysis show a significant positive influence of precipitation in the period April-August on Ca concentration in leaves, and a negative influence of air temperature on Ca, P and Mg concentrations.

3 - CLIMATE & RADIAL GROWTH



Correlation analysis based on TRW and CRU 0.5x0.5° gridded climate data set revealed a positive correlation between TRW and precipitation in June and negative influence of temperatures in June.



Figs: Correlation between tree-ring width (TRW) and temperature (top) and precipitation (bottom). Dashed line denote 95% significance threshold for correlation coefficient.

CONCLUSIONS

- ▶ Descriptors of vitality (TRW, defoliation and Ca concentration in leaves) show similar sensitivity (immediate response) to drought, but with different response in time (prolonged influence on TRW and defoliation after drought)
- ▶ June high temperatures and low precipitation have a significant negative influence on growth – if this starts to happen more frequently it will become a serious limiting factor for beech

THANK YOU FOR
YOUR ATTENTION

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