

Process-based modeling of daily growth as a function of environmental forcing in mixed temperate forests

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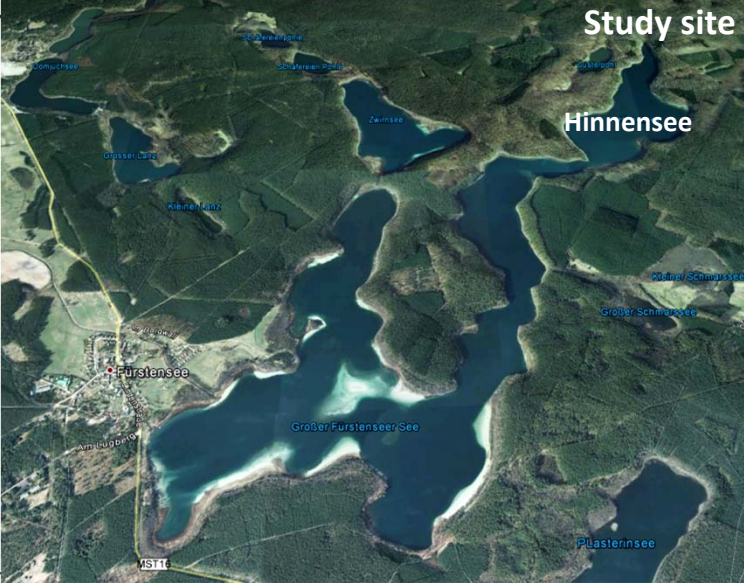
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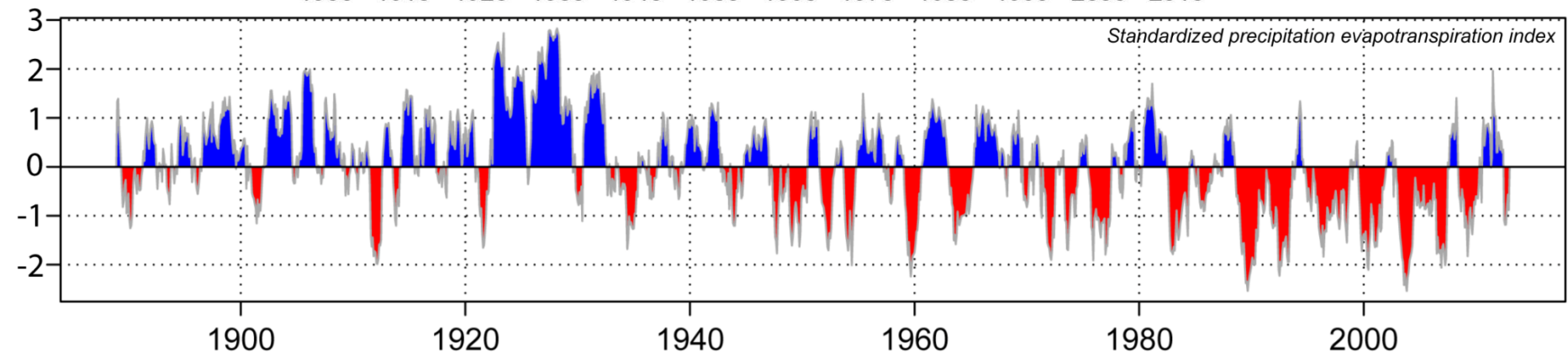
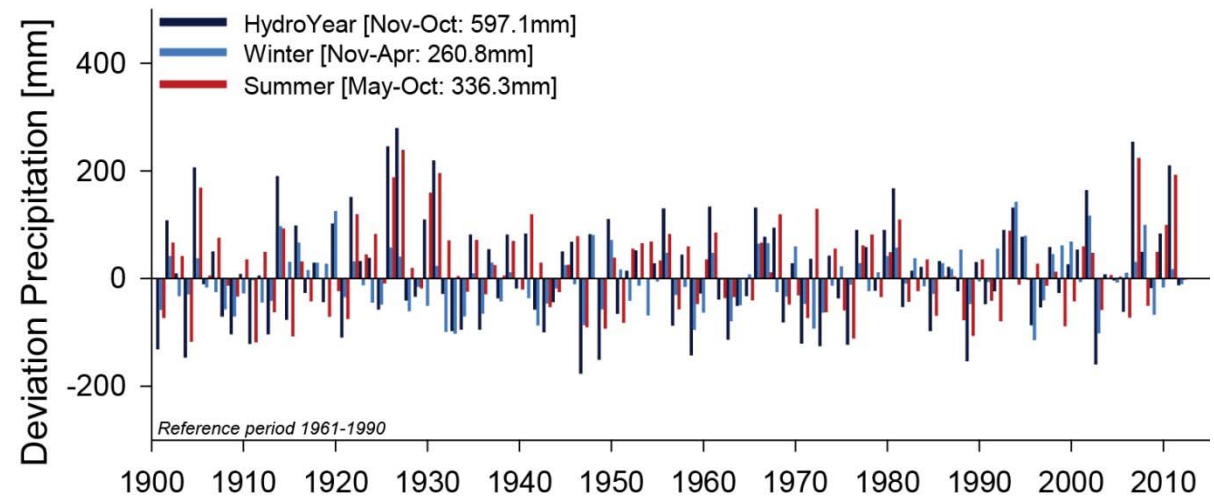
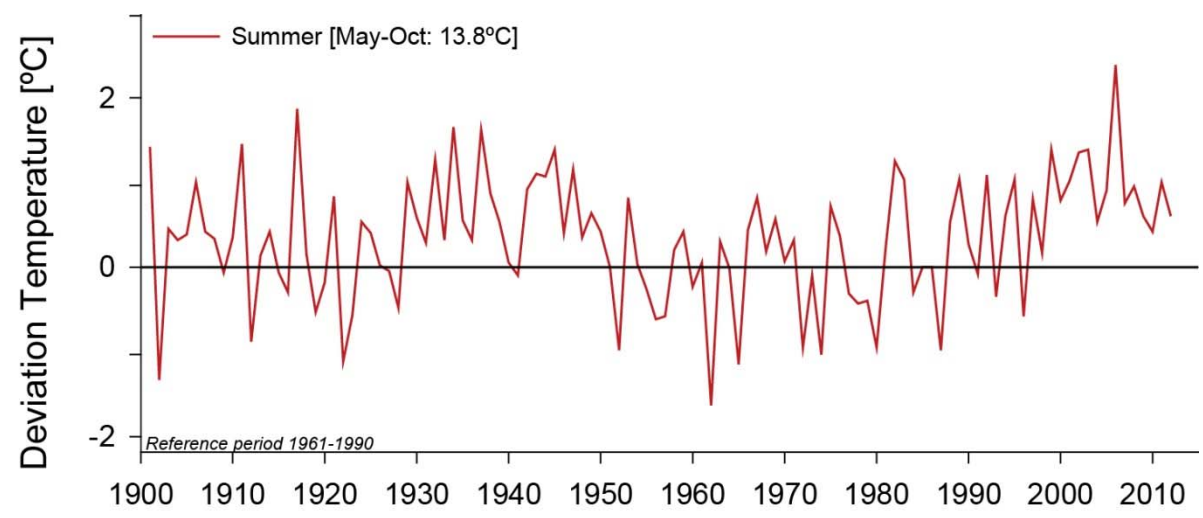


Müritz-
Nationalpark



NE Germany

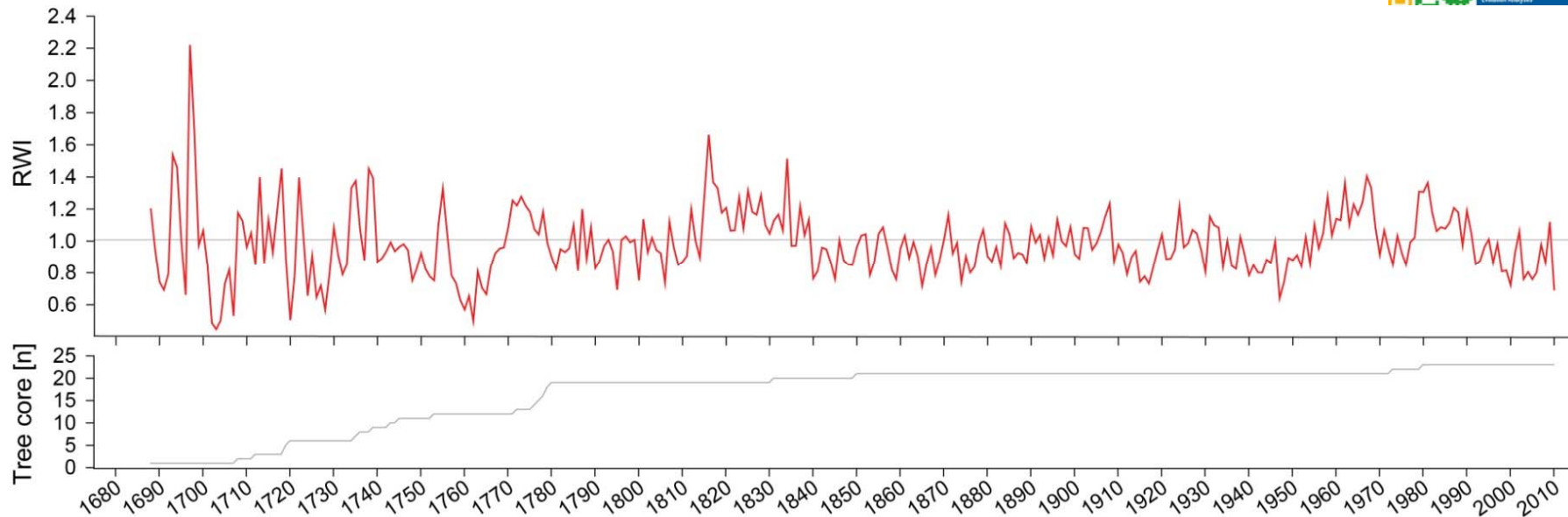




Dendrochronology

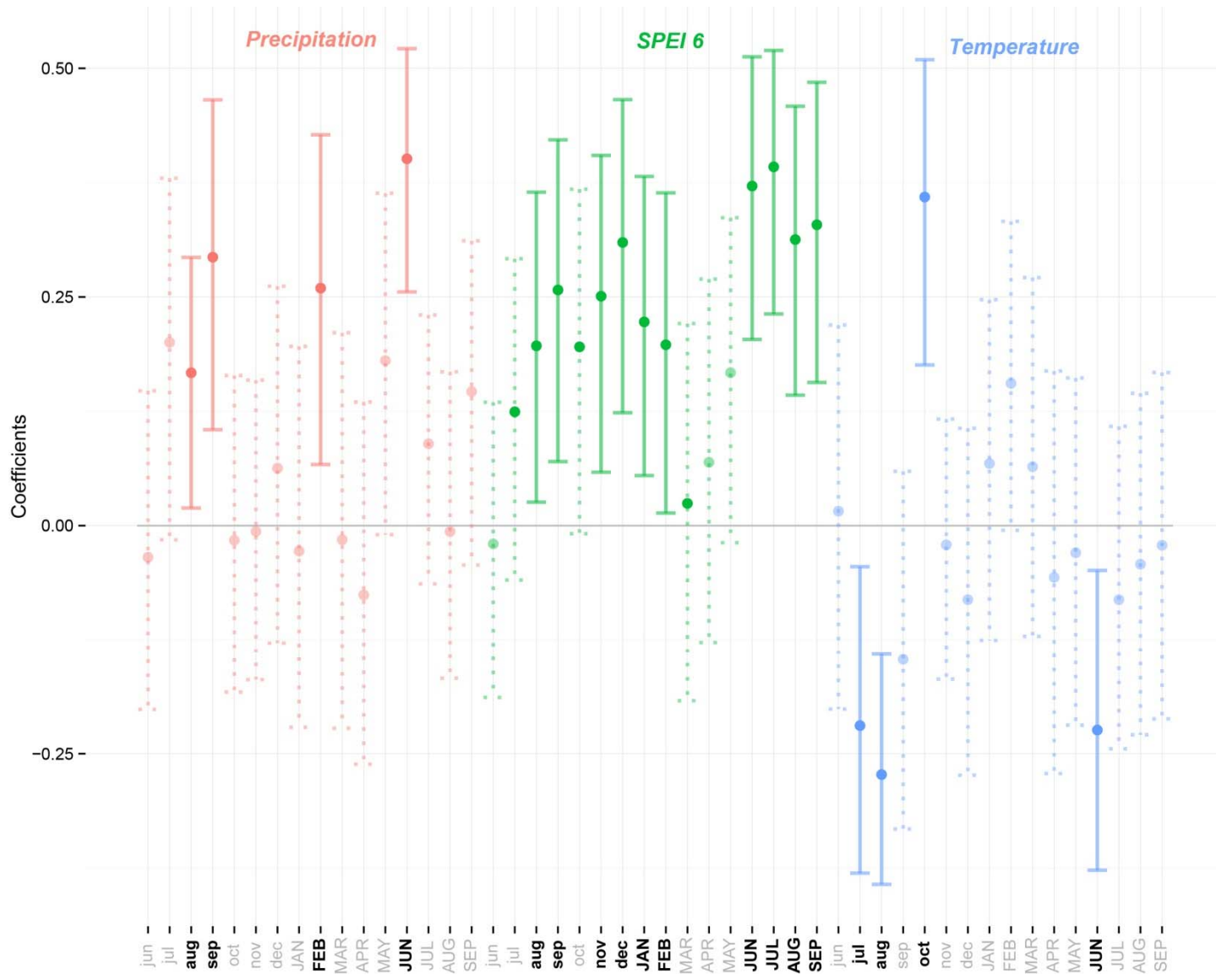
- Study of annually dated tree-ring time series
- Different proxies
 - Tree-ring width
 - Isotopes
 - Wood anatomical parameters
- Understand the response of proxy to climate or reconstruct past climates

Oak ring width chronology

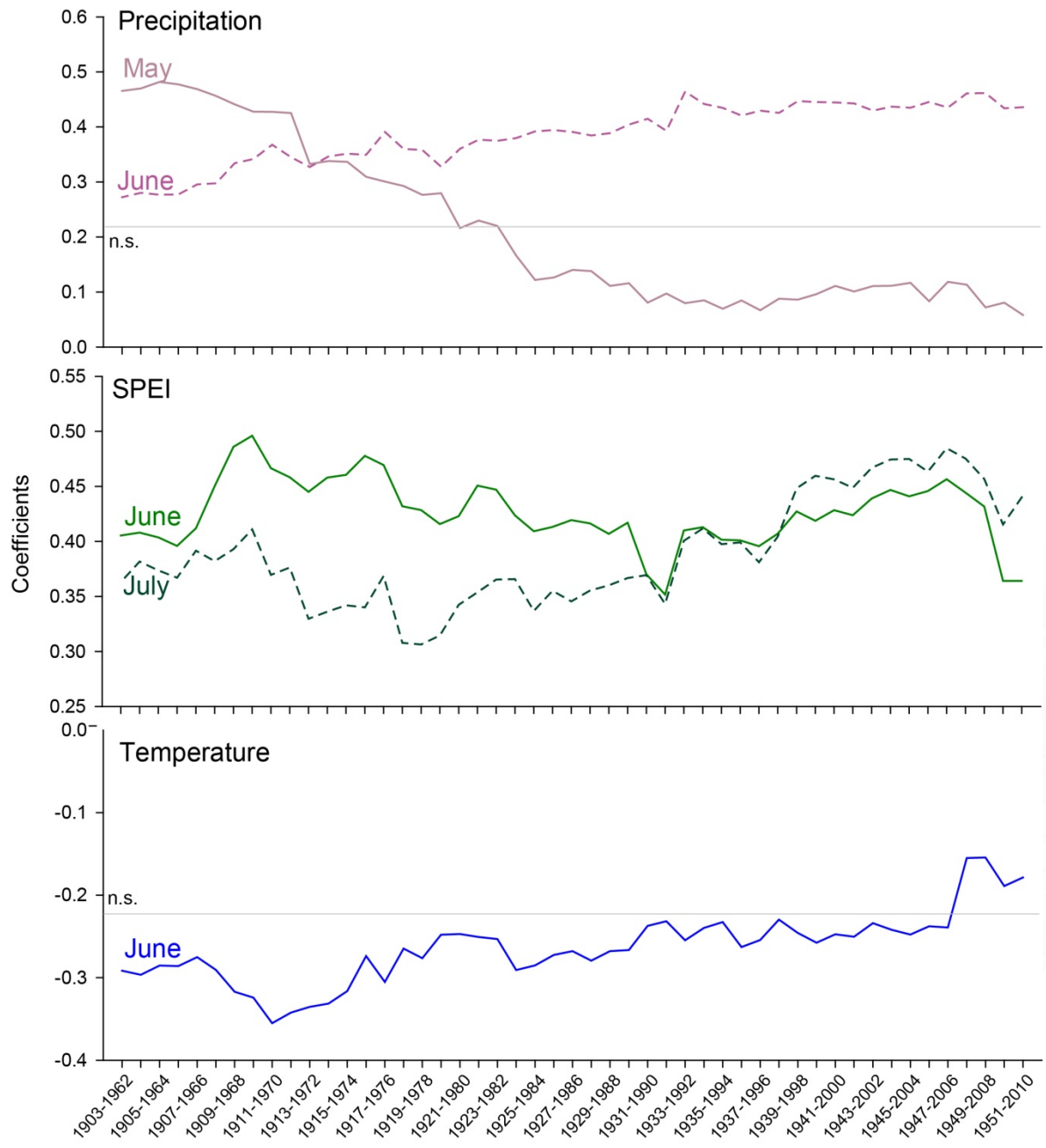


- > 300-year long chronology
- $EPS > 0.85$: 1780-2010
- Climate data from 1900

Climate – growth relationship



Signal stability



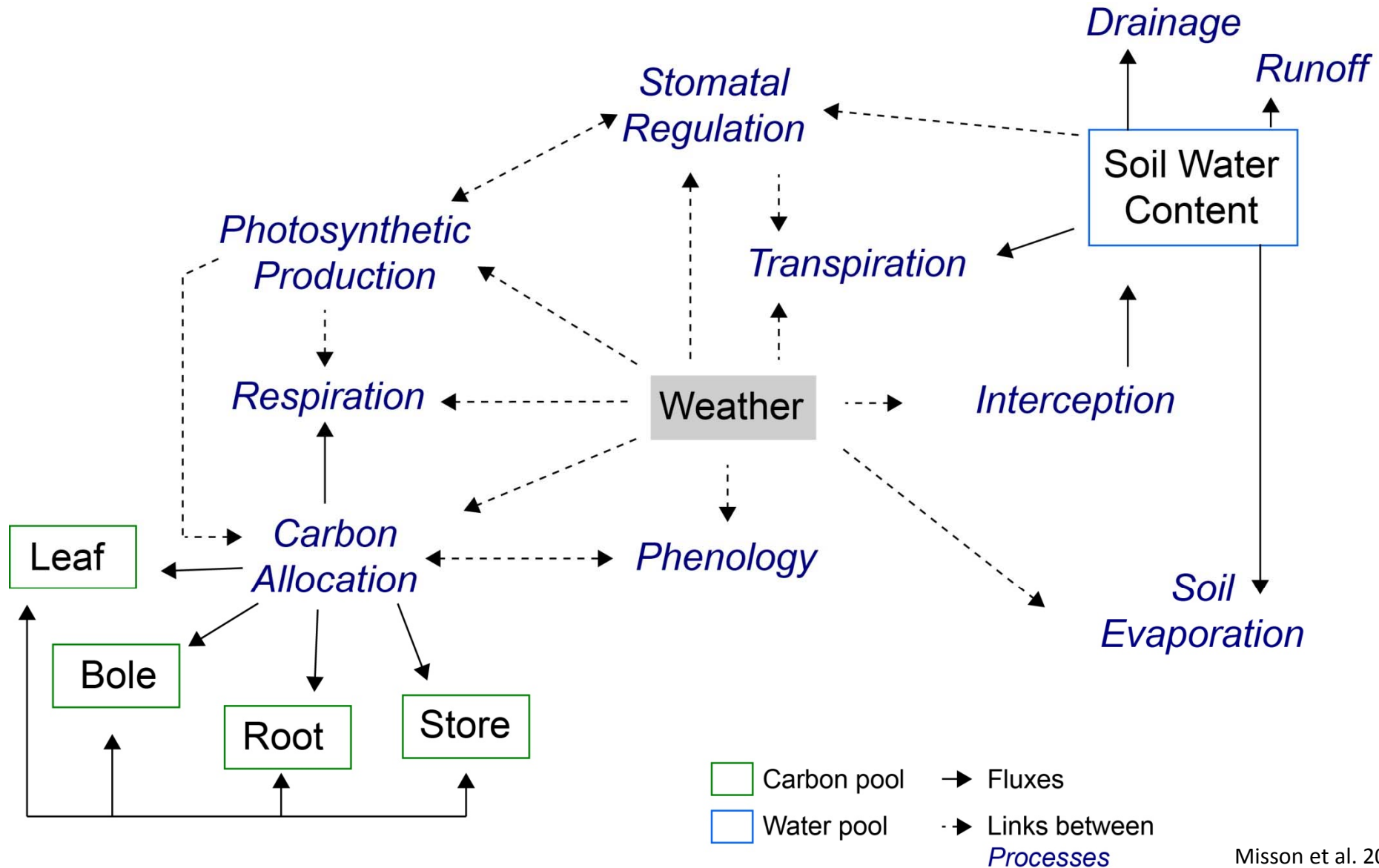
- Statistical approaches
 - No major changes in the tree environment
 - linear relationships
 - Underlying processes -> black box

Ecophysiological modeling

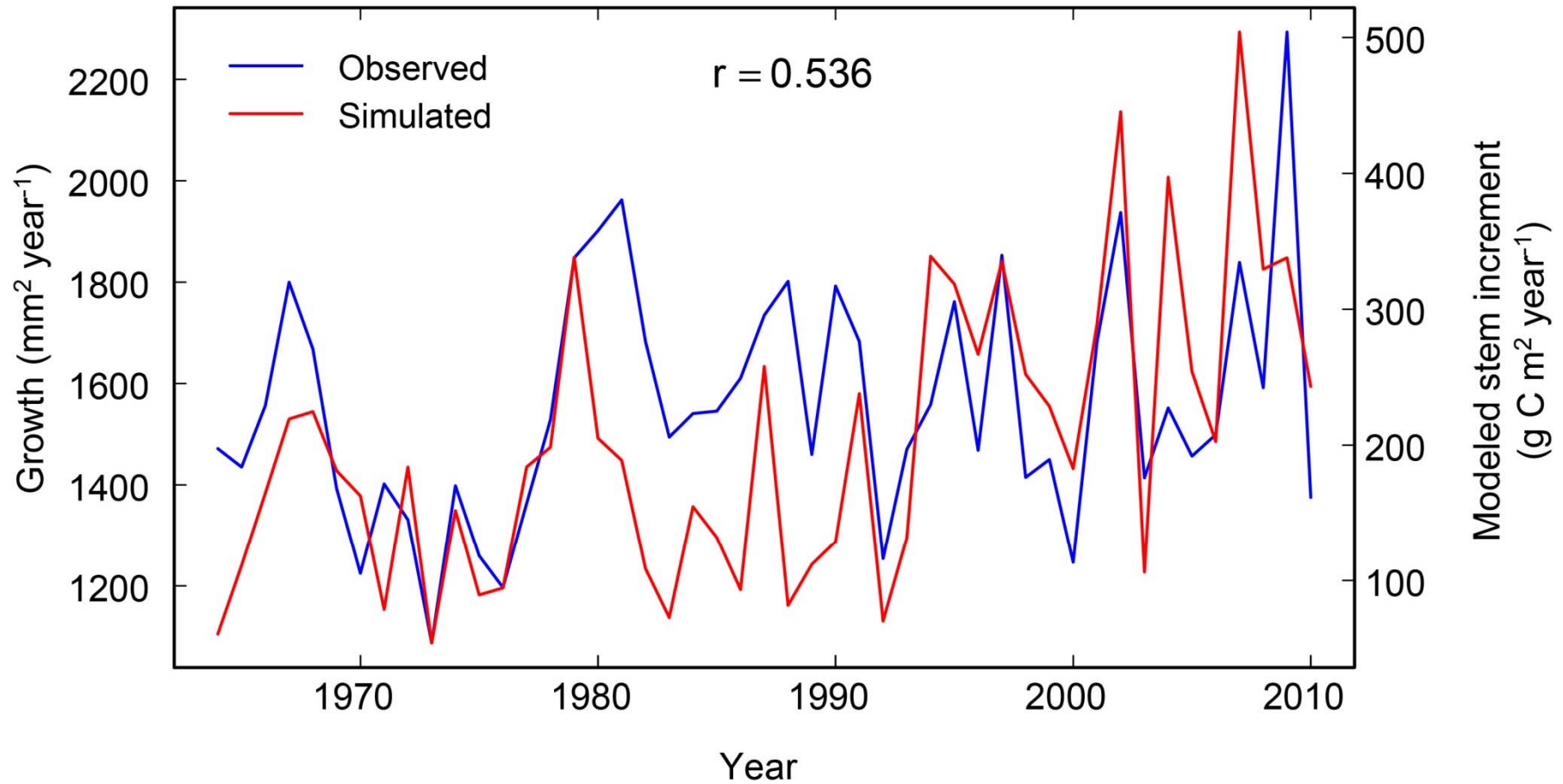


- Process-based models
 - Opportunity to go beyond the limitations of statistical approaches
- Forward mode
 - Driven by climate and other environmental factors
- Inverse mode
 - Climate information can be extracted

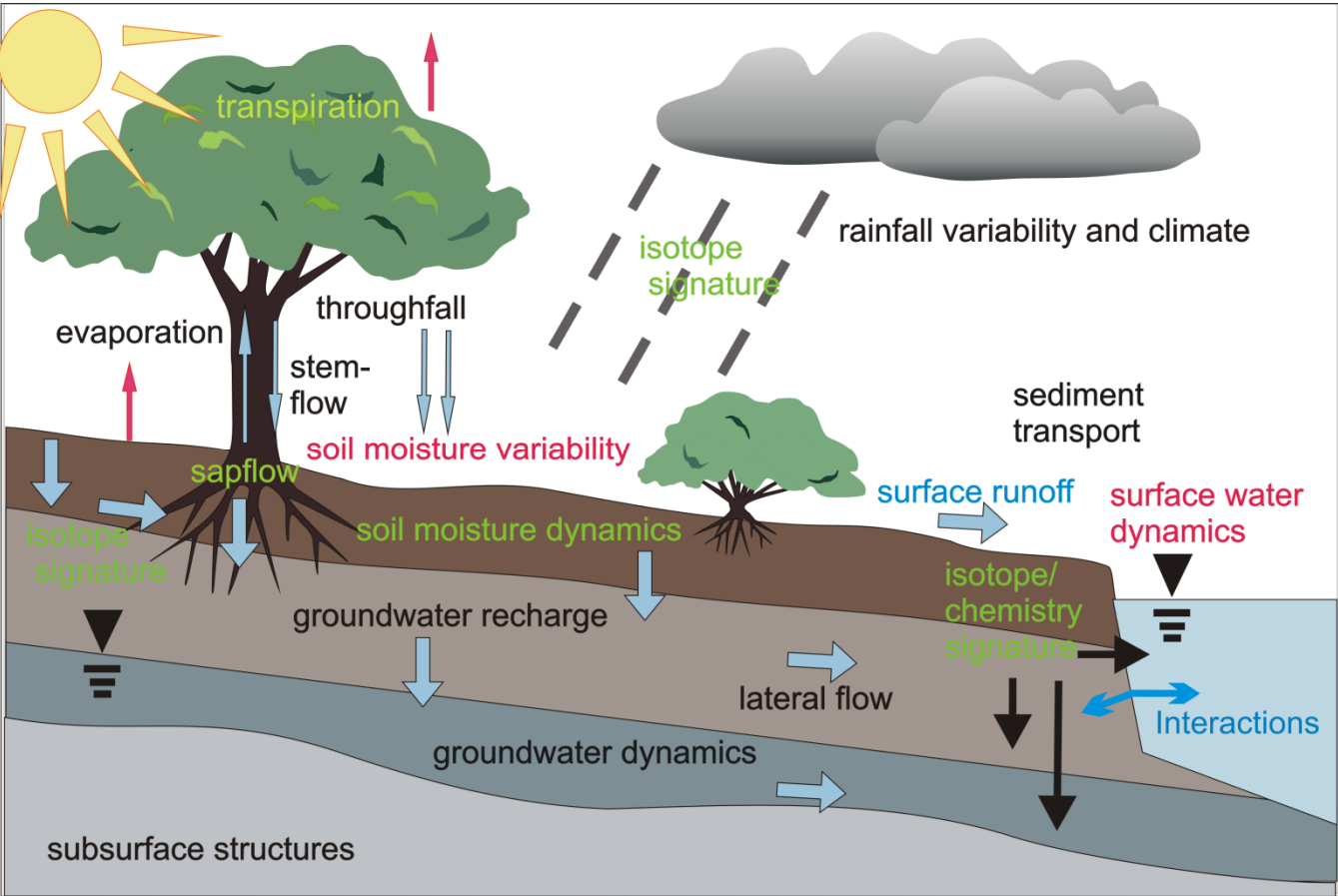
MAIDEN model

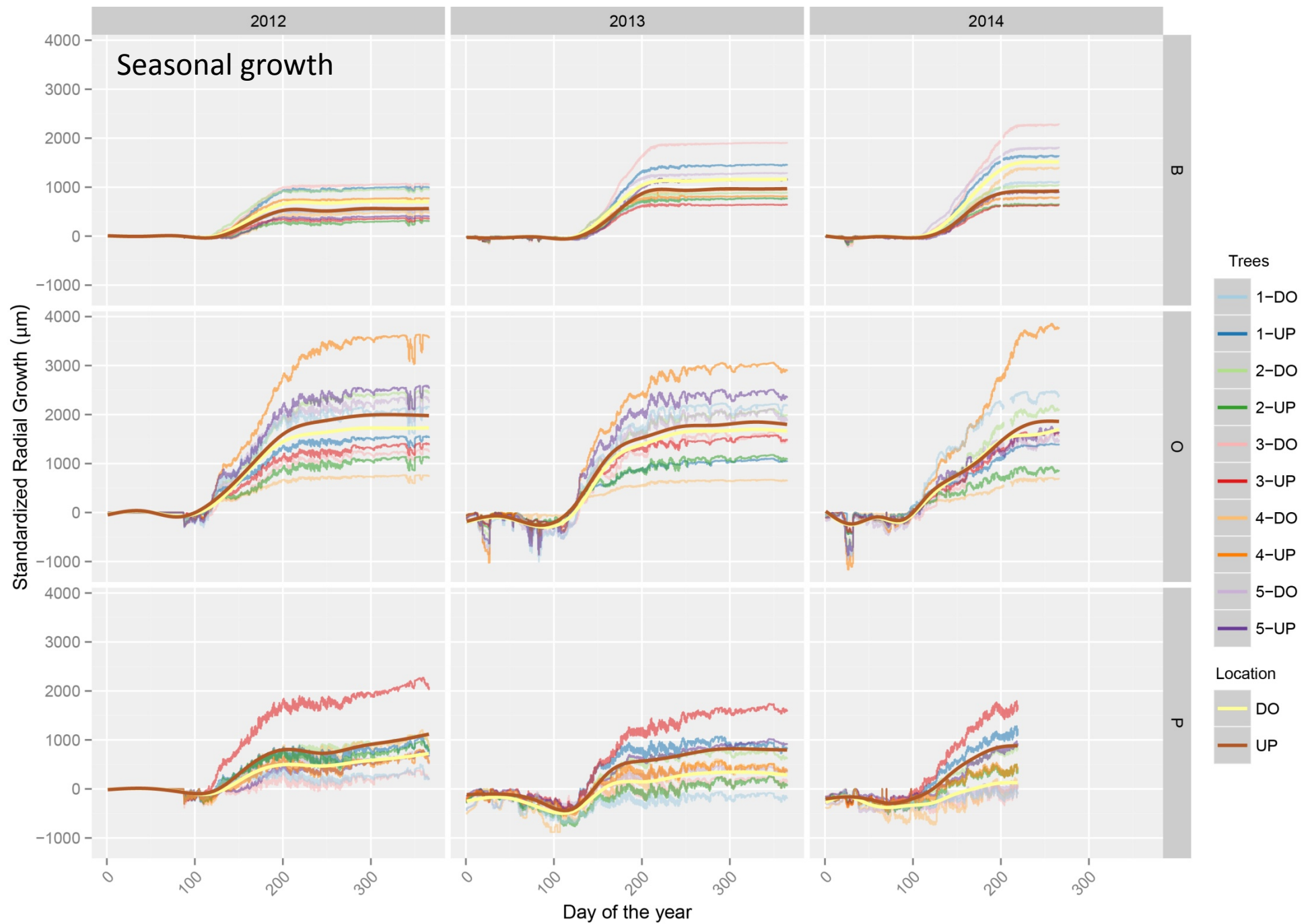


Simulation

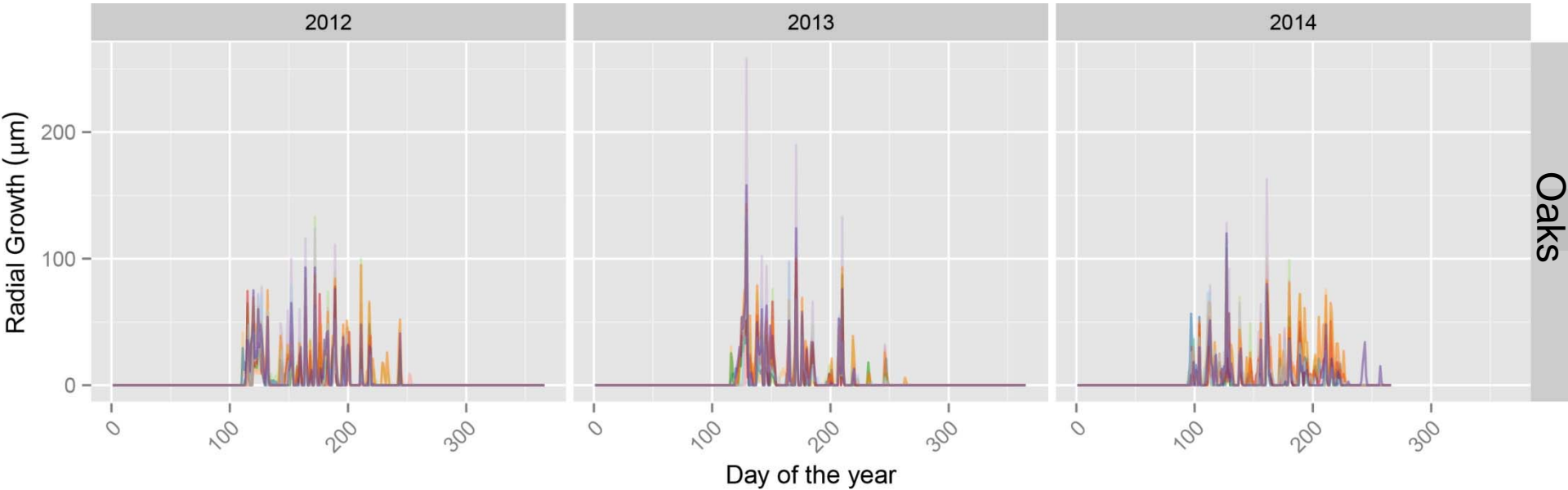


Monitoring site





Daily growth



Summary

- Long-lived climate-sensitive species
- Monitoring site
- MAIDEN model
 - Opportunity to gain a better understanding of the system
 - Inverse modeling: promising approach for robust climate reconstruction

Thank you!

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