

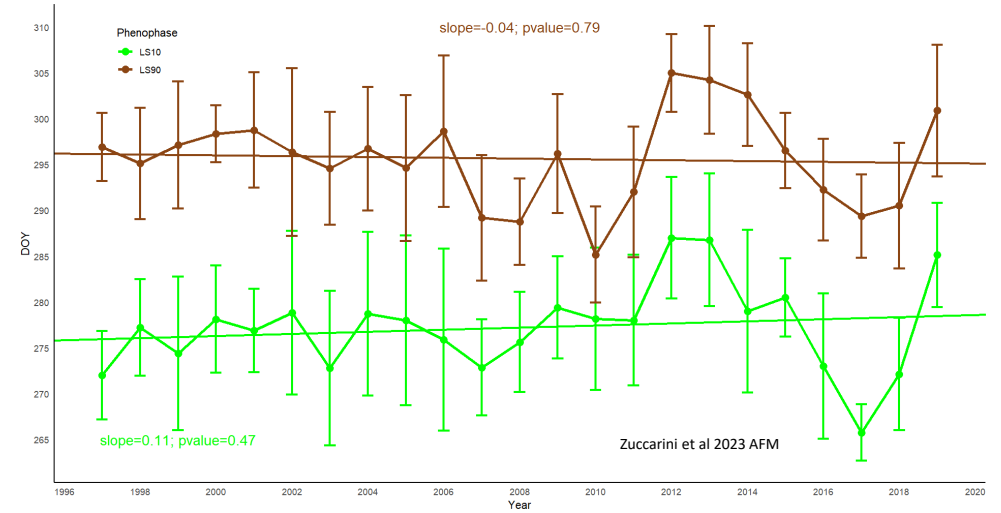
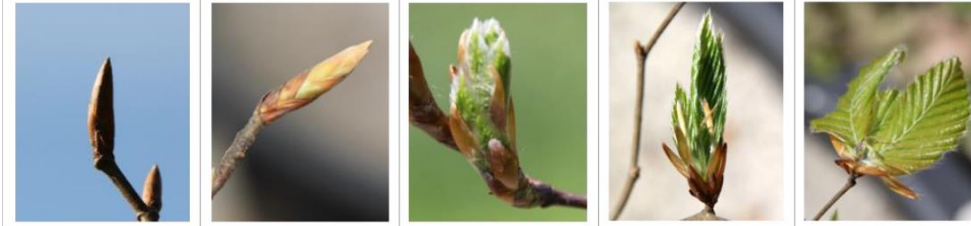


# Seasonal growth in temperate deciduous forests

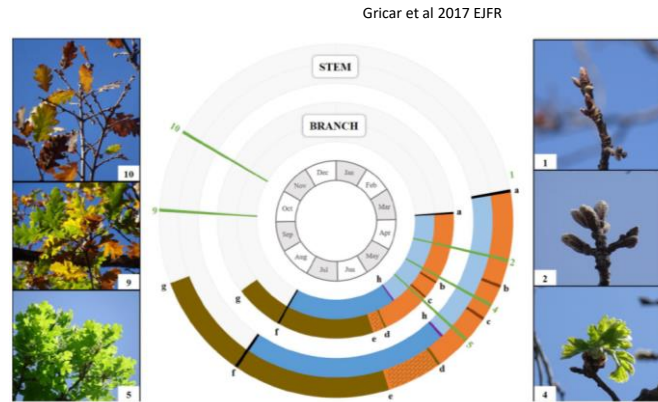
Matteo Campioli et al.  
[matteo.campioli@uantwerpen.be](mailto:matteo.campioli@uantwerpen.be)



- Phenology: “*study of recurrent biological events*”



- Leaves, wood, roots..



- Environmental drivers of phenology (temp, nutrients, lights etc.)

Global Change Biology (2006) 12, 1969–1976, doi: 10.1111/j.1365-2486.2006.01193.x

### European phenological response to climate change matches the warming pattern

ANNETTE MENZEL\*, TIM H. SPARKS†, NICOLE ESTRELLA\*, ELISABETH KOCH‡, ANTO AASAŞ, REIN AHASS, KERSTIN ALM-KÜBLER¶, PETER BISSOLLI||

**APPLICATIONS**  
 \*climate modelling  
 \*forestry

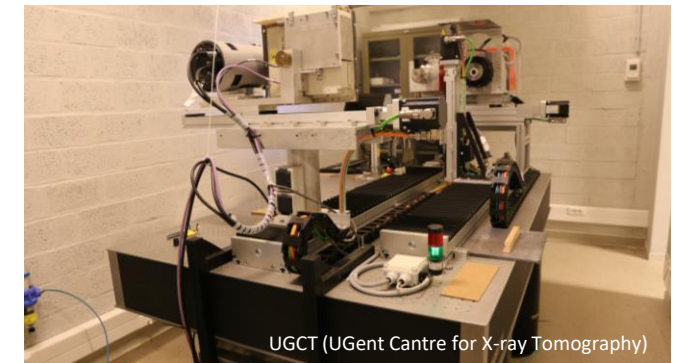
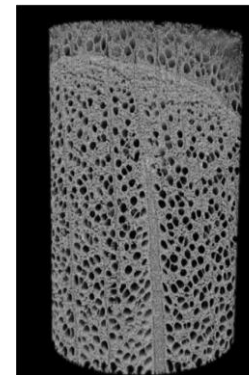
## Relation between spring leaf phenology and carbon and nitrogen reserves of trees in temperate Europe (Belgium, Spain, Norway)

FIELD-WORK SPRING AND SUMMER 2025 - LAB WORK  
SUMMER 2025



## Measuring seasonal wood production (with X-ray) and link to forest CO2 fluxes

HIGH-TECH with LIMITED FIELDWORK



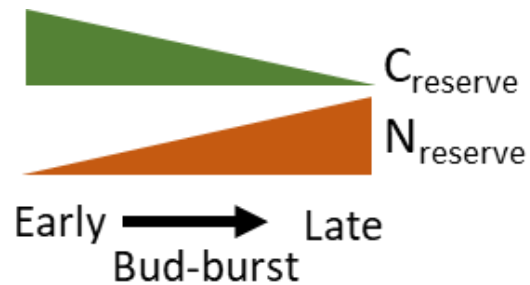
Some topics more suited for MP, other for IP – ask for details

# Eco-physiological dynamics behind the inter-tree bud-burst timing variability in temperate deciduous forests



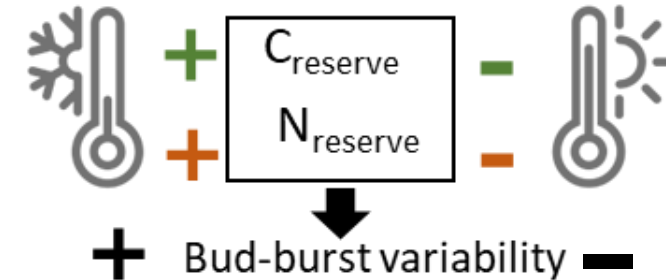
**Why budburst data variability among trees same species, age and site?**

**H1: at individual level tree reverse content influence bud-burst timing**



- Phenology observation (spring)
- Sampling of wood (spring)

**H2: At population level climate condition reserve content but also individual variability**



- Sampling of wood (spring)

- Bio-chemical analysis:
  - carbon reserve (starch & soluble sugar)
  - Nitrogen reserve (proteins & amino acids)
- Statistical analyses



# Different approaches for tree carbon uptake assessment



Forests capture CO<sub>2</sub> from the atmosphere and store it as biomass. This makes **forests** and more specifically **trees** important **carbon sinks** and **crucial to mitigate climate change**.

In this MSc thesis we **measure** the actual **amount of carbon stored** at **seasonal level** (day to week for a whole year) in a forest (Brasschaat, Antwerp) using **different methods** (X-ray, flux tower and dendrometers) at **different scales** (tree, forest)



How big is your tree?

**Tree** height and width are crucial to determine the biomass



X-ray and wood anatomy

Determine size growth and biomass accumulation on **tree level**



Forest carbon fluxes

Link the current **forest** biomass accumulation to CO<sub>2</sub> uptake



Forest capture CO<sub>2</sub>

Calculate the total carbon stock of the **forest**