

# Wood Anatomy & Hydraulics in *Pinus sylvestris*

**Main investigator:**

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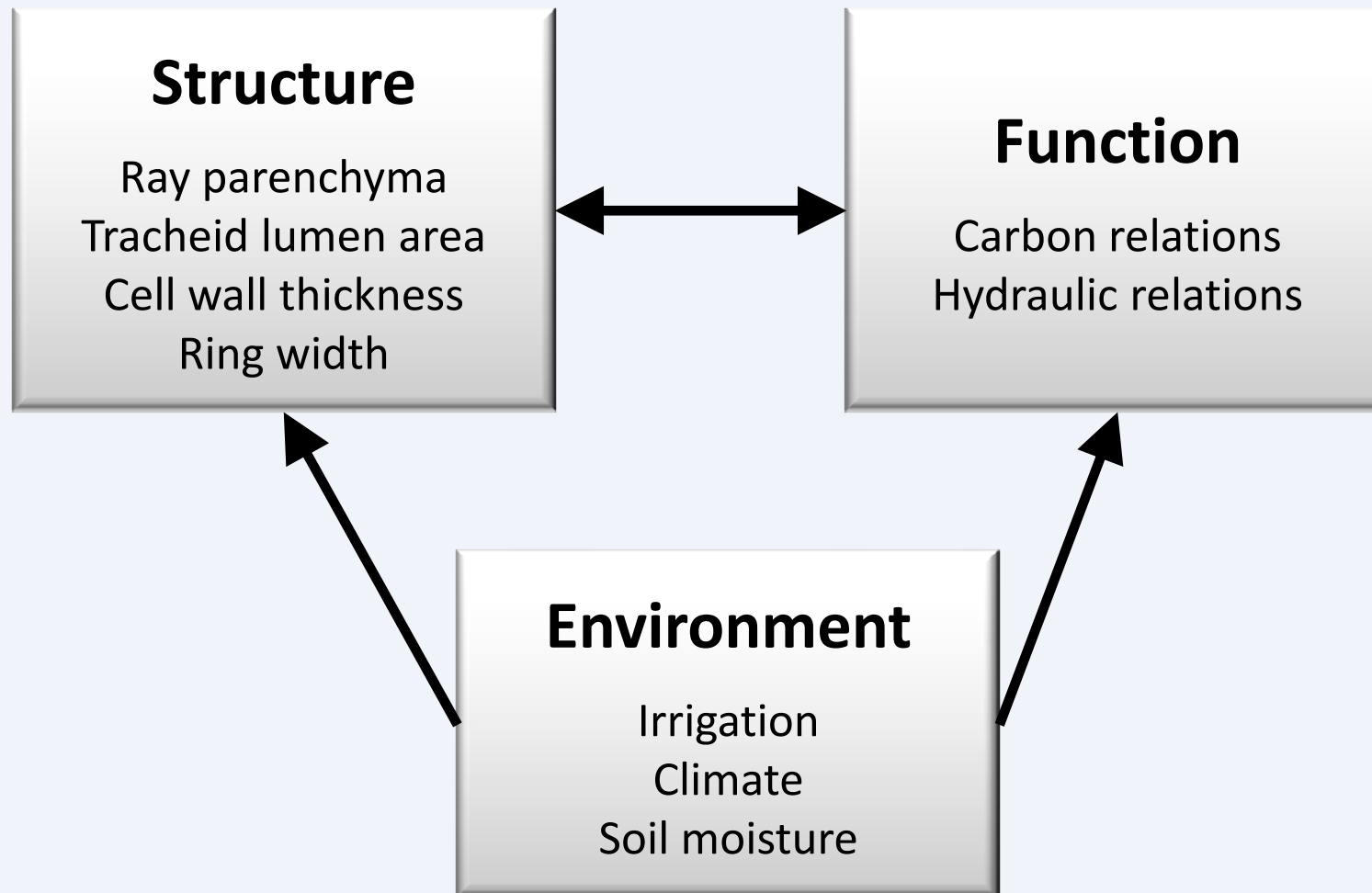
**WSL collaborators:**

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**External collaborators:**

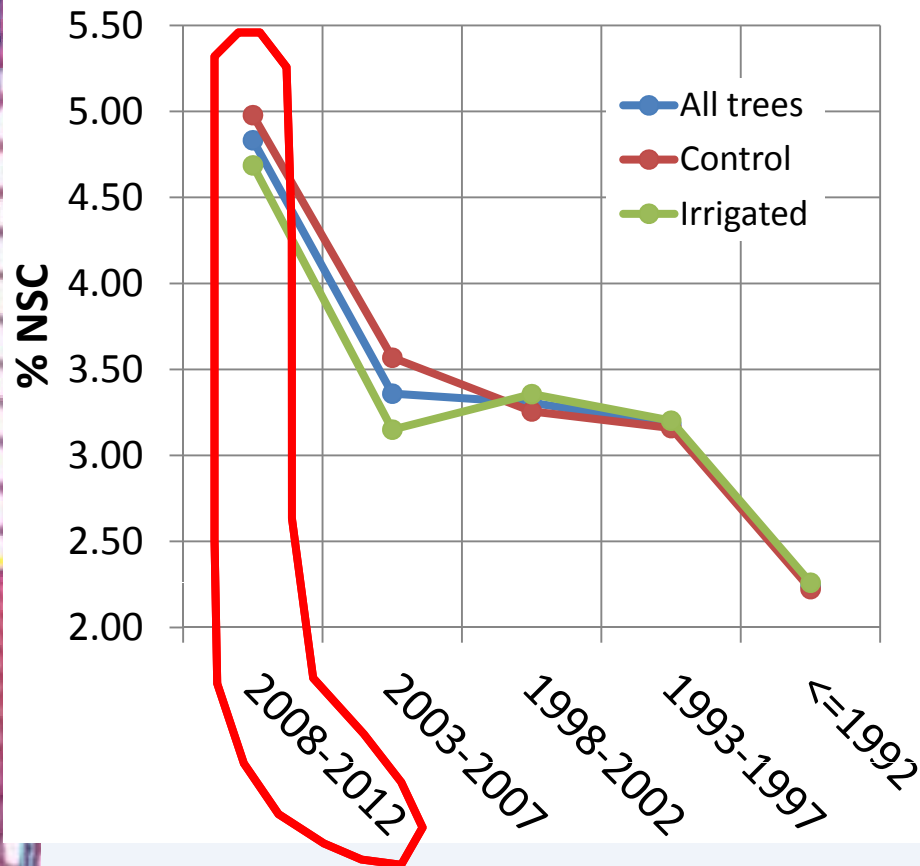
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José Olano & Alberto Arzac (Univ. Valladolid/Bilbao, E)

# Framework



# How do NSC pools in the stem compare to ray parenchyma as a major storage tissue?

Radial distribution of % NSC

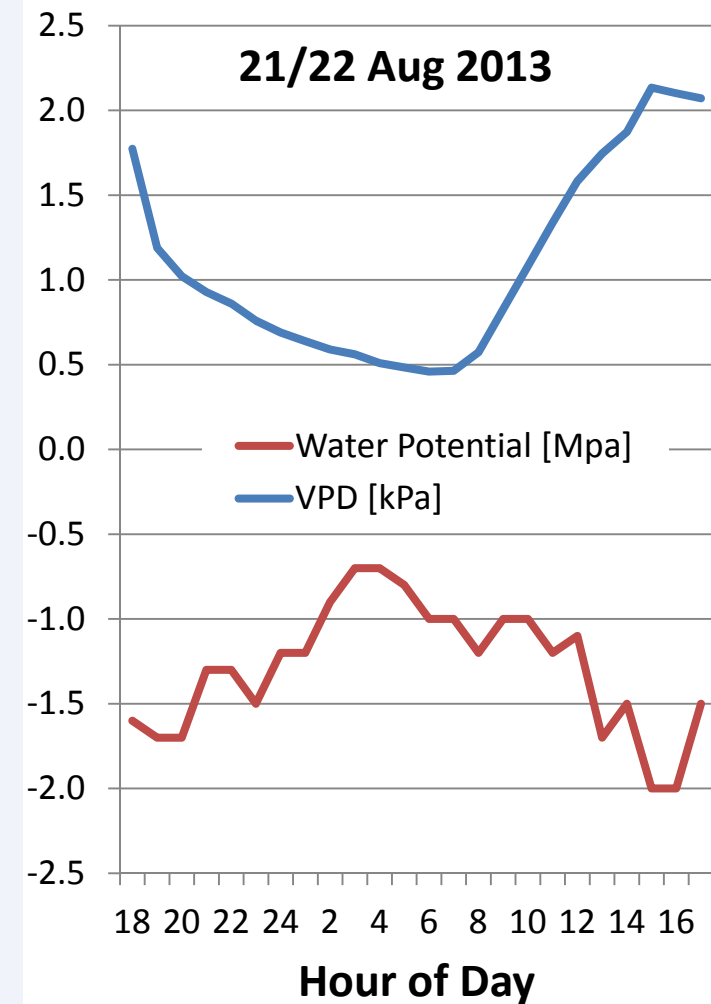
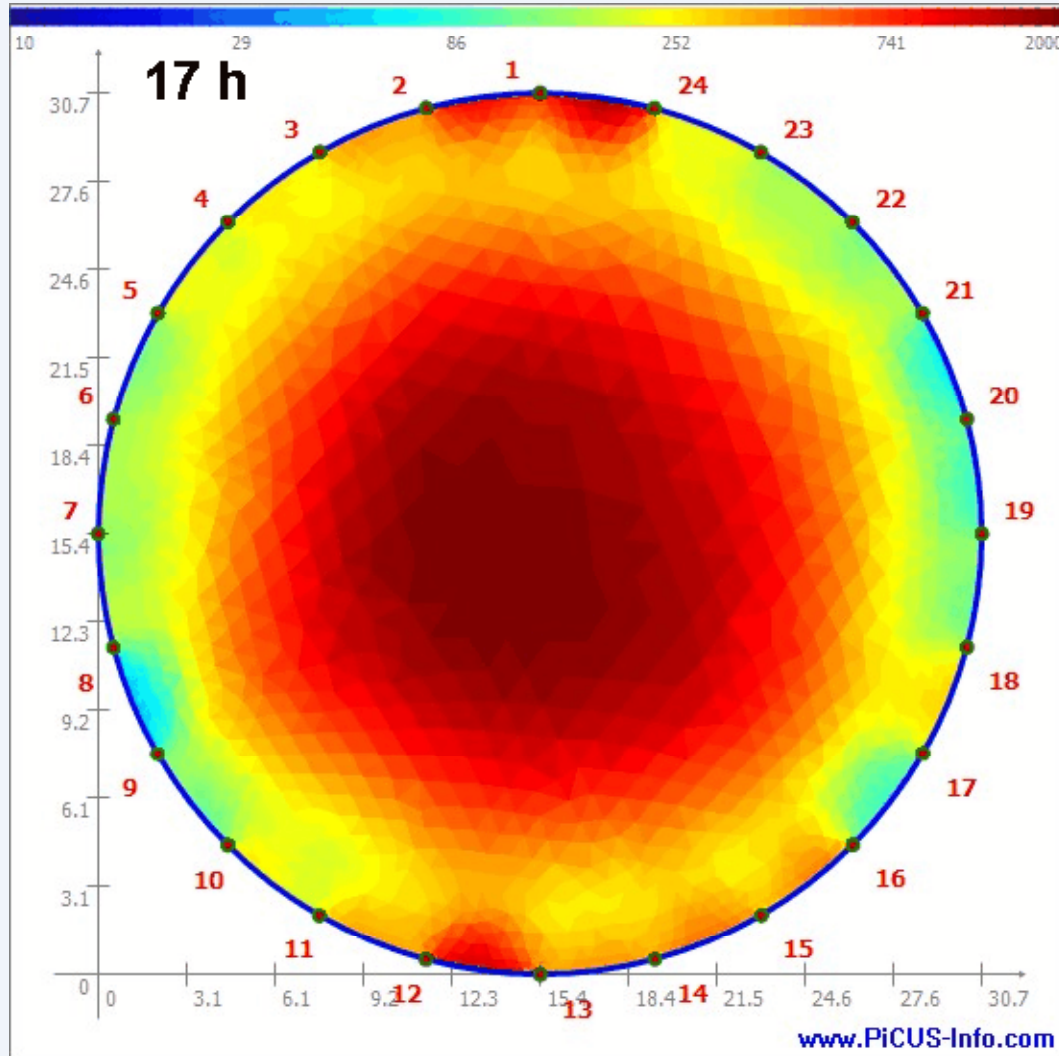


## Outmost segment (2008-2012):

- For each additional mm of ring growth [NSC] decreased by 1%! ... but the absolute NSC content within the 5-year period was greater if rings were wider!
- The % of ray parenchyma does not depend on [NSC] or any other considered parameter \*

\* treatment, stem diameter, ring growth, mistletoe infection, crown transparency

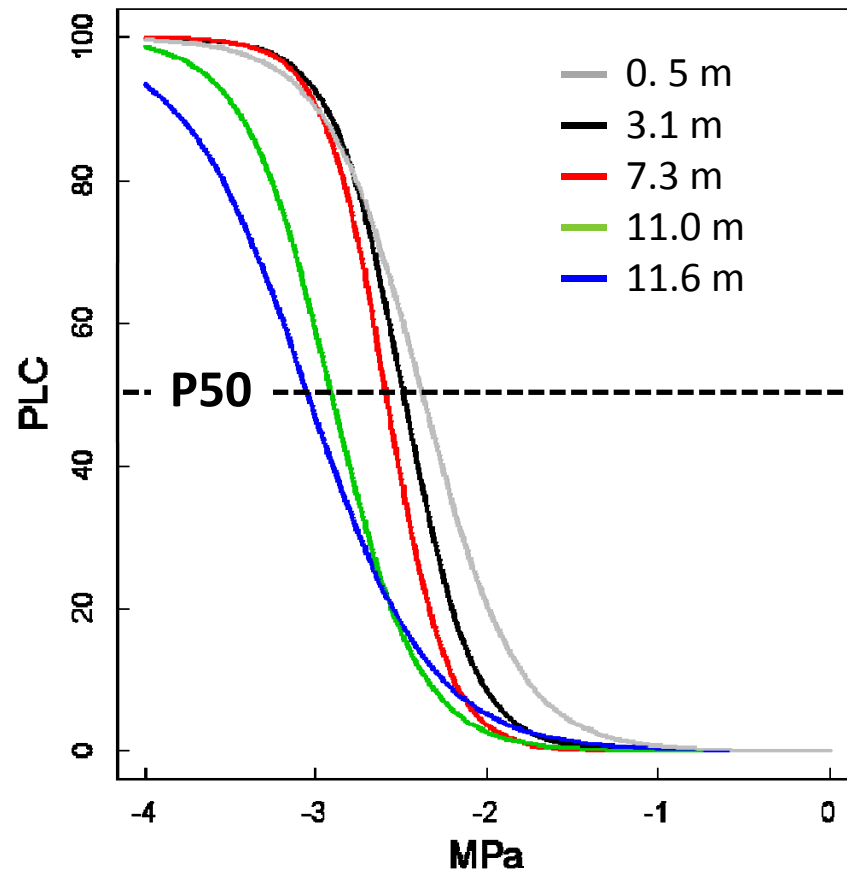
# What are the temporal dynamics of stem water distribution?



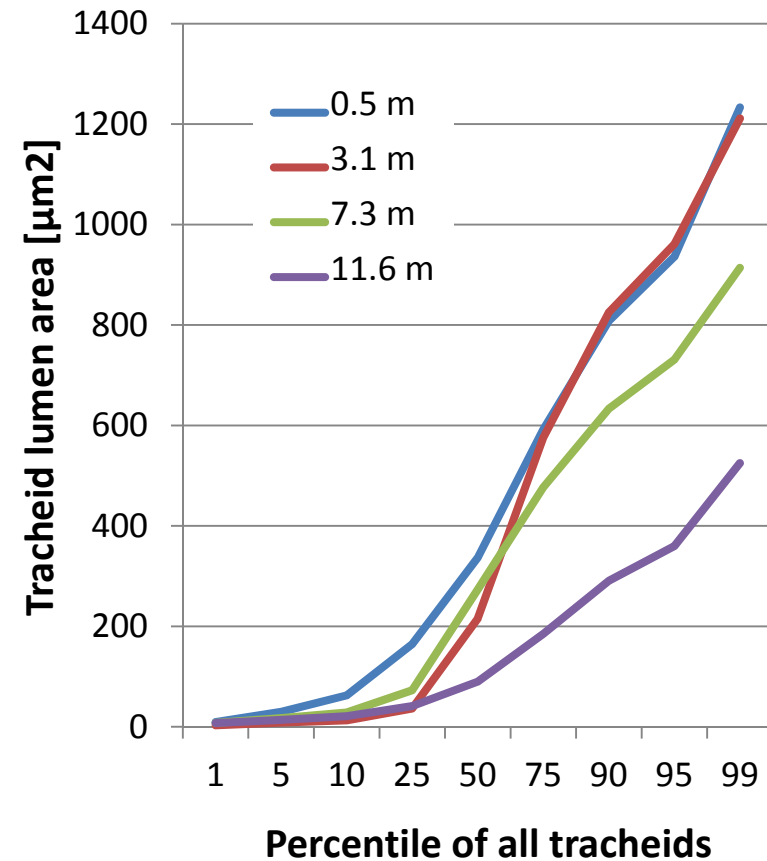


## How do the hydraulic structure-function relationships change along the stem axis?

### Loss of hydraulic conductivity



### Tracheid lumen area



# Collected Data

## 40 trees (20 / treatm.):

- Absolutely dated **ring width** chronology
- 20-yr chronologies of **ray parenchyma**, **resin ducts**, **tracheid lumen area (all cells!)**, **tracheid cell wall thickness (all cells!)**
- **[NSC] in 4×5-yr blocks & remaining sapwood**

## 15 trees\* (5 control, 5 irrig. continued, 5 irrig. stopped):

- **Electric impedance tomograms** from dry and moist periods (**2013**, **2014**)

## 2 trees (1 / treatm.):

- **Axial vulnerability curves**, **leaf-specific conductivity**, **sapwood area**, **xylem-specific conductivity**, **wood anatomy**, **overall needle biomass**

## 2 trees (1 / treatm.):

- **Diurnal cycle of tomograms**, **leaf water potential**

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\* subset of 40 trees