Predicting Vertical Heartwood Diameter Profiles of Scots pine (*Pinus sylvestris* L.) Based on Data from the Forest

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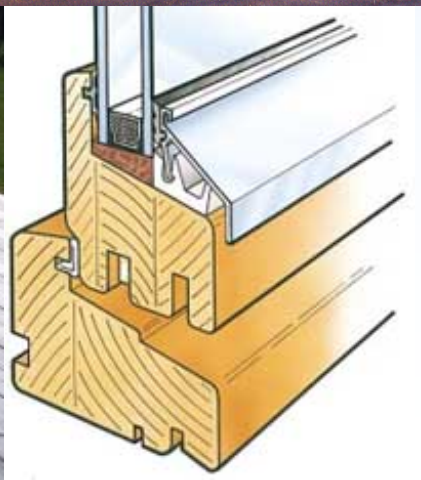
Background

- Increased interest in utilising natural durability of wood

- Scots pine traditionally used in above ground exterior structures exposed to risk of decay

INTRODUCTION



Challenge

The stemwood of Scots pine comprises heartwood and decay susceptible sapwood

Heartwood diameter

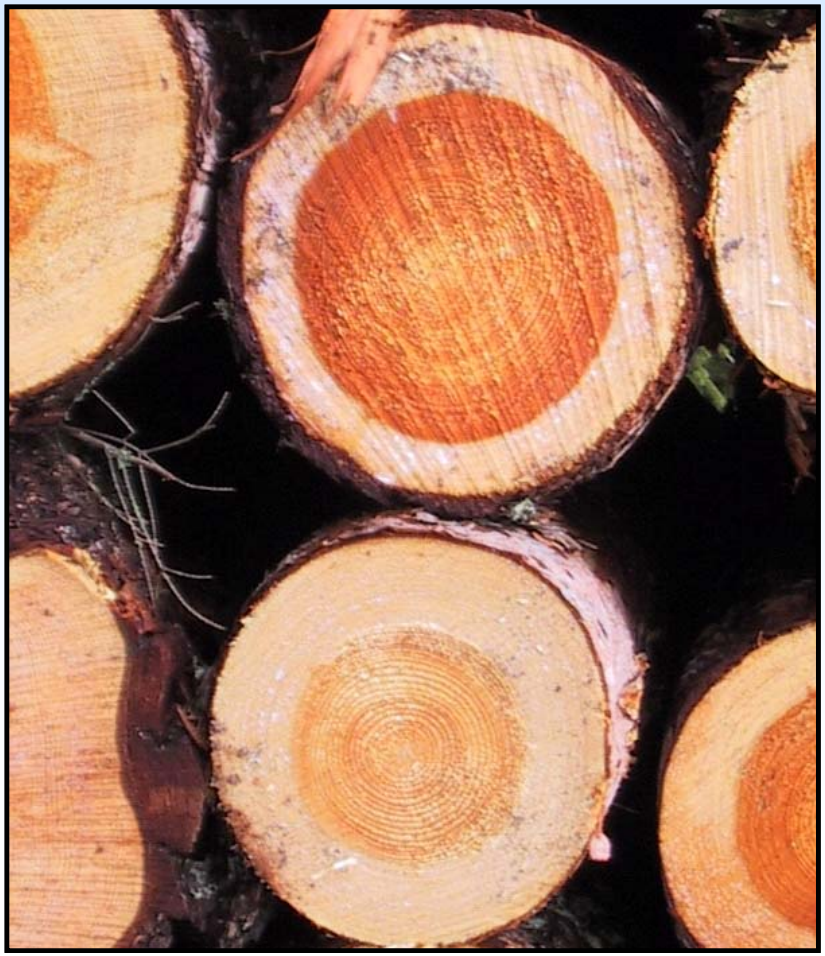


Photo: Peder Gjerdrum

Heartwood diameter

- Decisive for heartwood timber products

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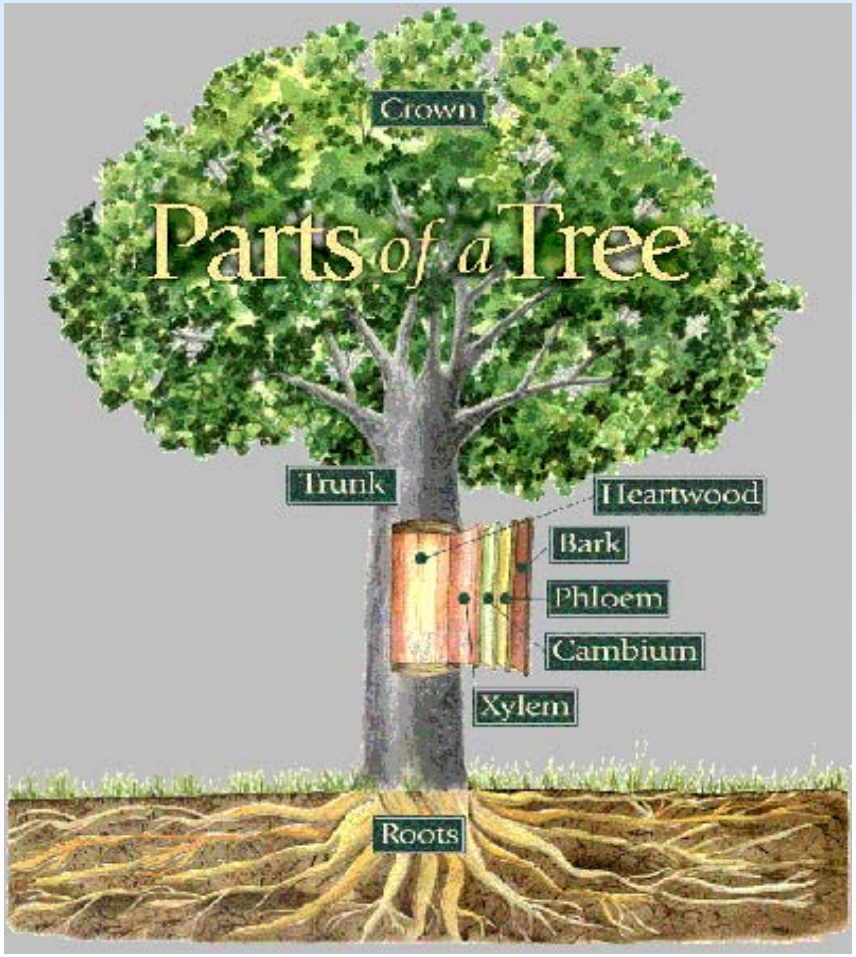
Heartwood diameter

- Decisive for heartwood timber products
- Heartwood diameter varies (within and between trees)

Heartwood diameter

- Decisive for heartwood timber products
- Heartwood diameter varies (within and between trees)
- Difficult to measure heartwood diameter on standing trees

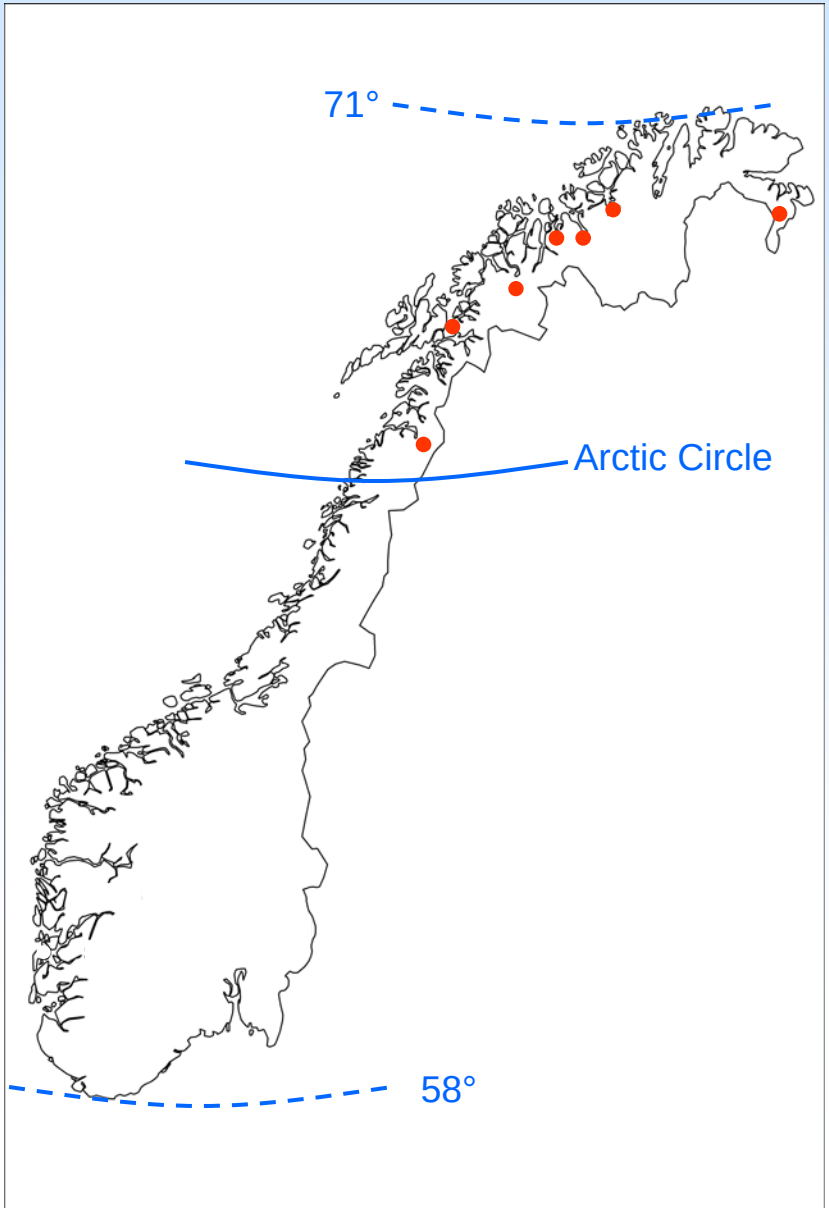


Objectives

- Study vertical profiles of heartwood diameter and develop a model for predicting heartwood diameter in Scots pine trees

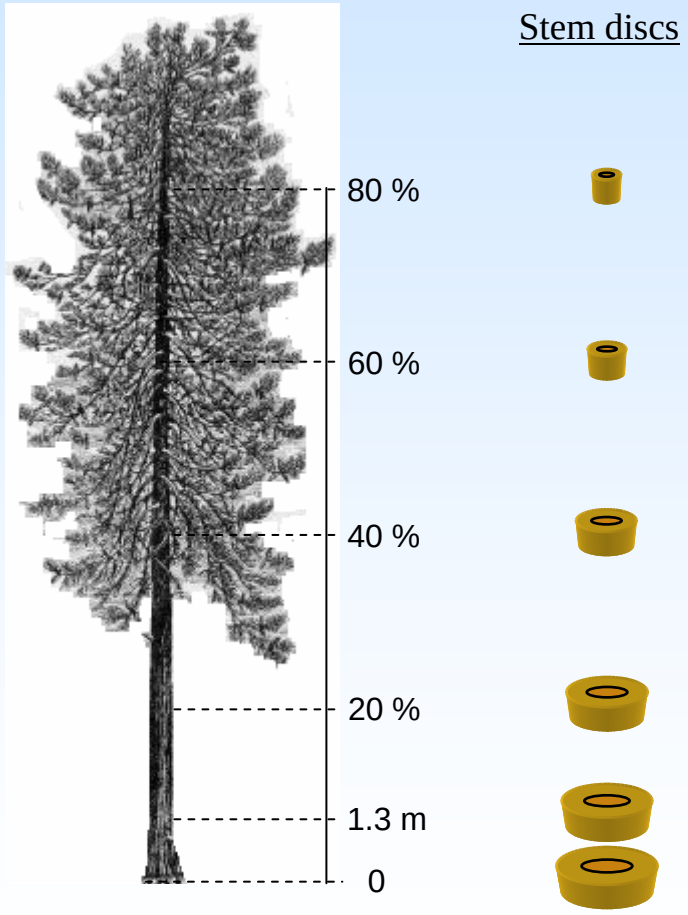
MATERIAL

- 7 locations in Northern Norway
  - 8 trees from each location



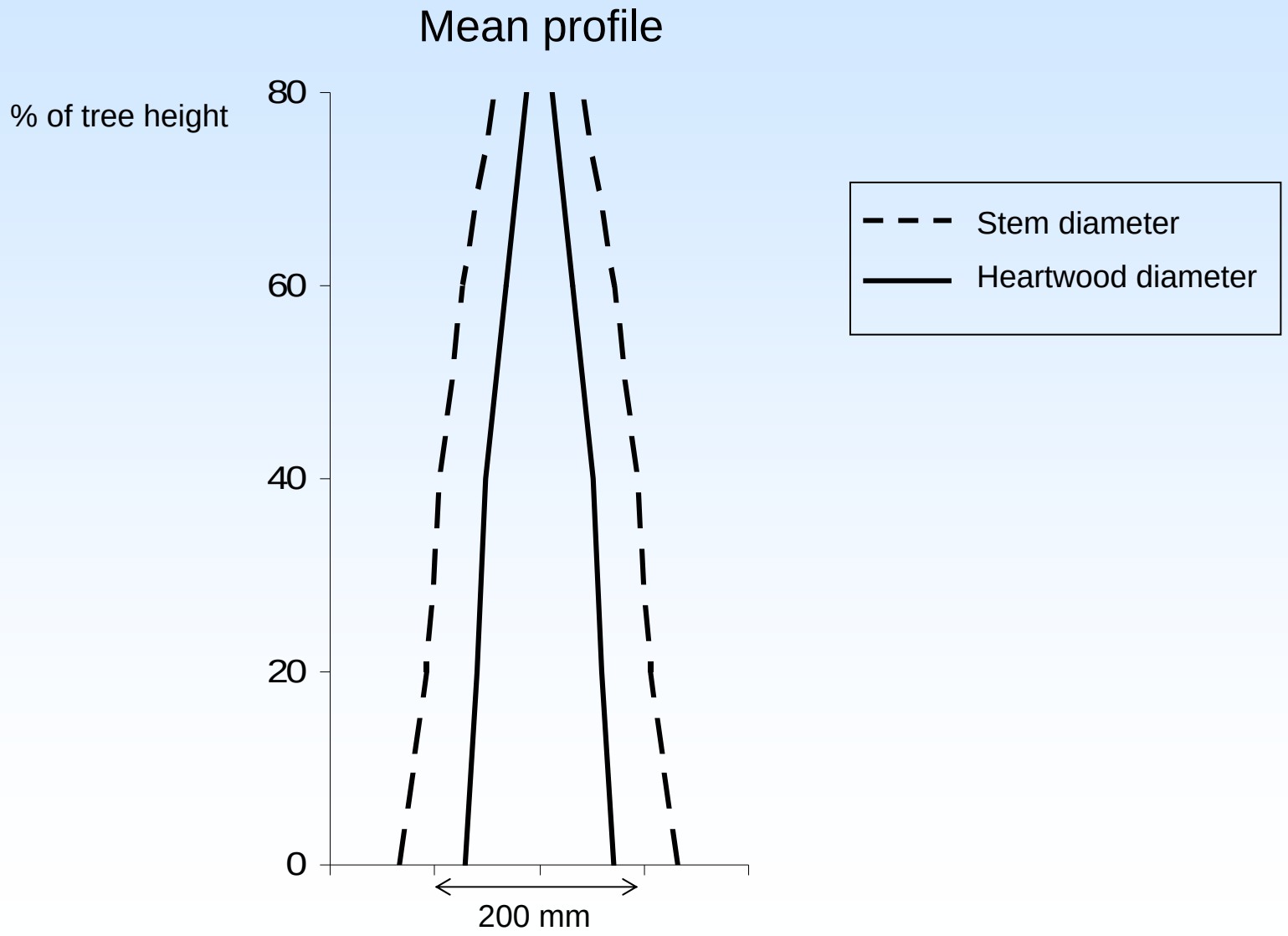
MATERIAL

- 7 locations in Northern Norway
  - 8 trees from each location
    - 6 stem discs from each tree

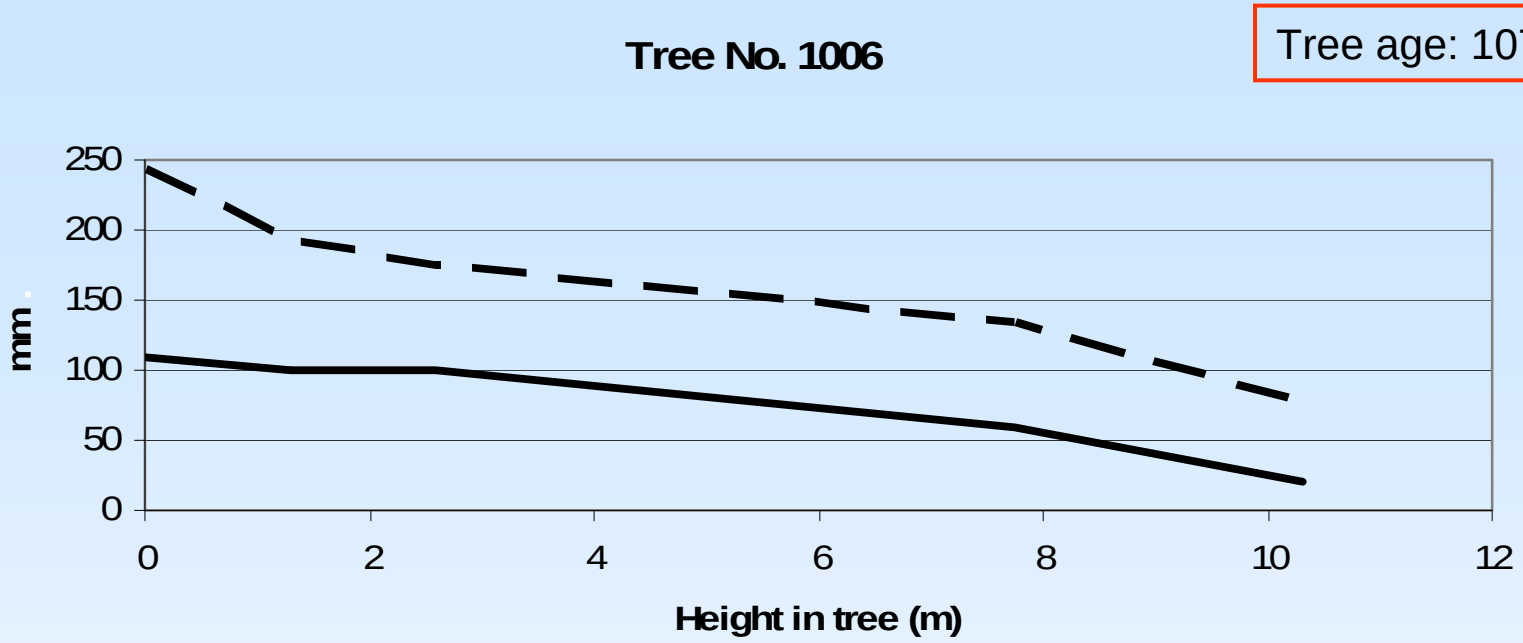


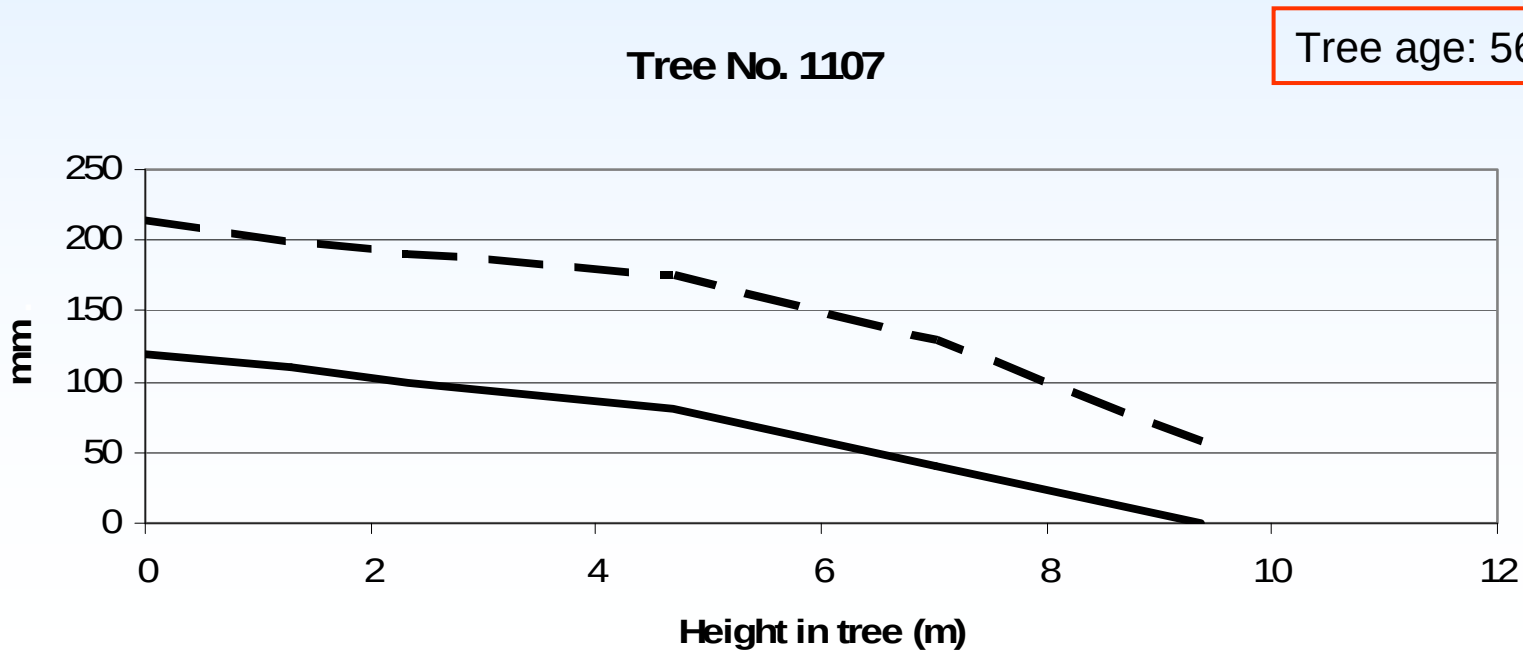
RESULTS

Heartwood diameter profiles



RESULTS

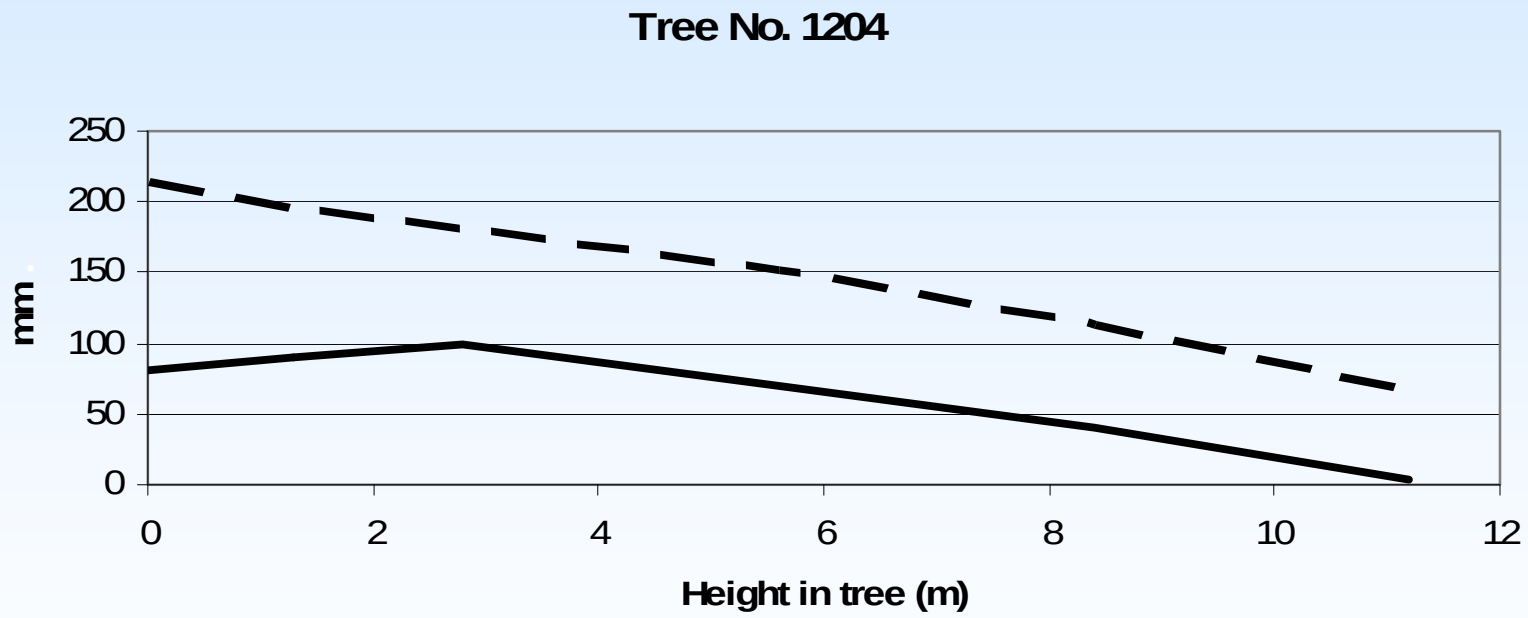

Tree No. 1006
Tree age: 107 years
250
200
150
100
50
0
mm
0
2
4
6
8
10
12
Height in tree (m)


Tree No. 1107
Tree age: 56 years
250
200
150
100
50
0
mm
0
2
4
6
8
10
12
Height in tree (m)

RESULTS

Heartwood diameter profiles

Tree age: 57 years



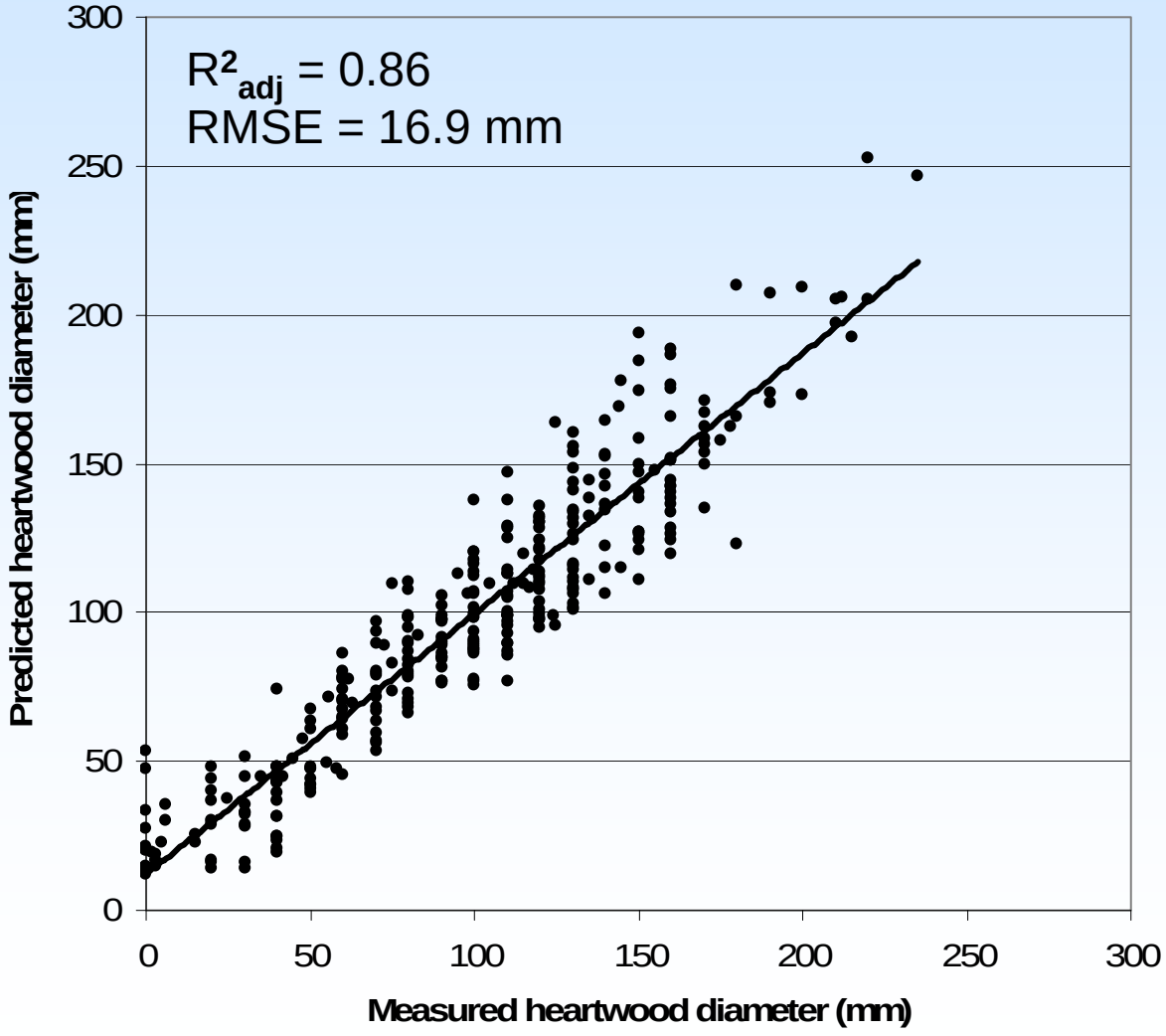
RESULTS

Heartwood diameter model

Heartwood diameter (mm) = -31.4 + 0.684*Diameter under bark (mm)

RESULTS

Heartwood diameter model



DISCUSSION

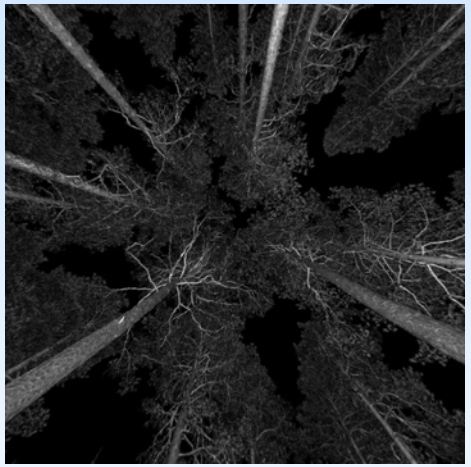
The model needs diameter profiles

- How can we measure input data ?

DISCUSSION

How can we measure input data ?

A: Terrestrial laser scanner



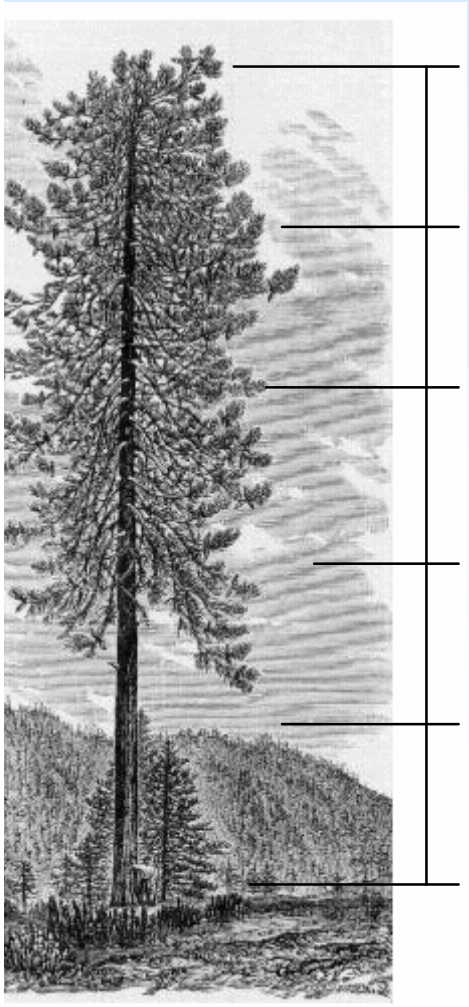
DISCUSSION

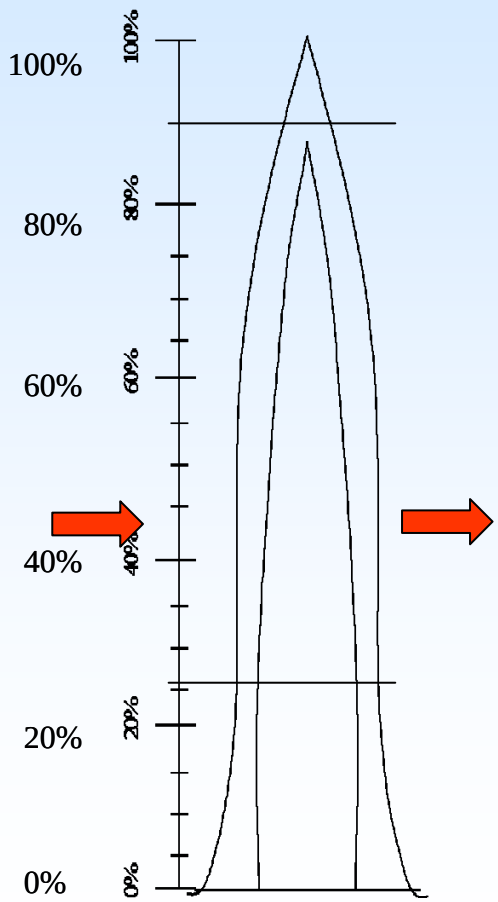
How can we measure input data ?

B: Harvester

DISCUSSION

Input data (diameter) measured by:
- Terrestrial laser-scanner
- Harvester





Thank you for your attention!