

Estimating carbon content in a tree

We can calculate the biomass of a tree by using research by [Zianis et al. \(2005\)](#) which shows the relationship between stem volume and biomass. We can assume a tree's biomass is 50% carbon.

In the field we need to record the species of the tree, and a few measurements to calculate the volume of the trunk.

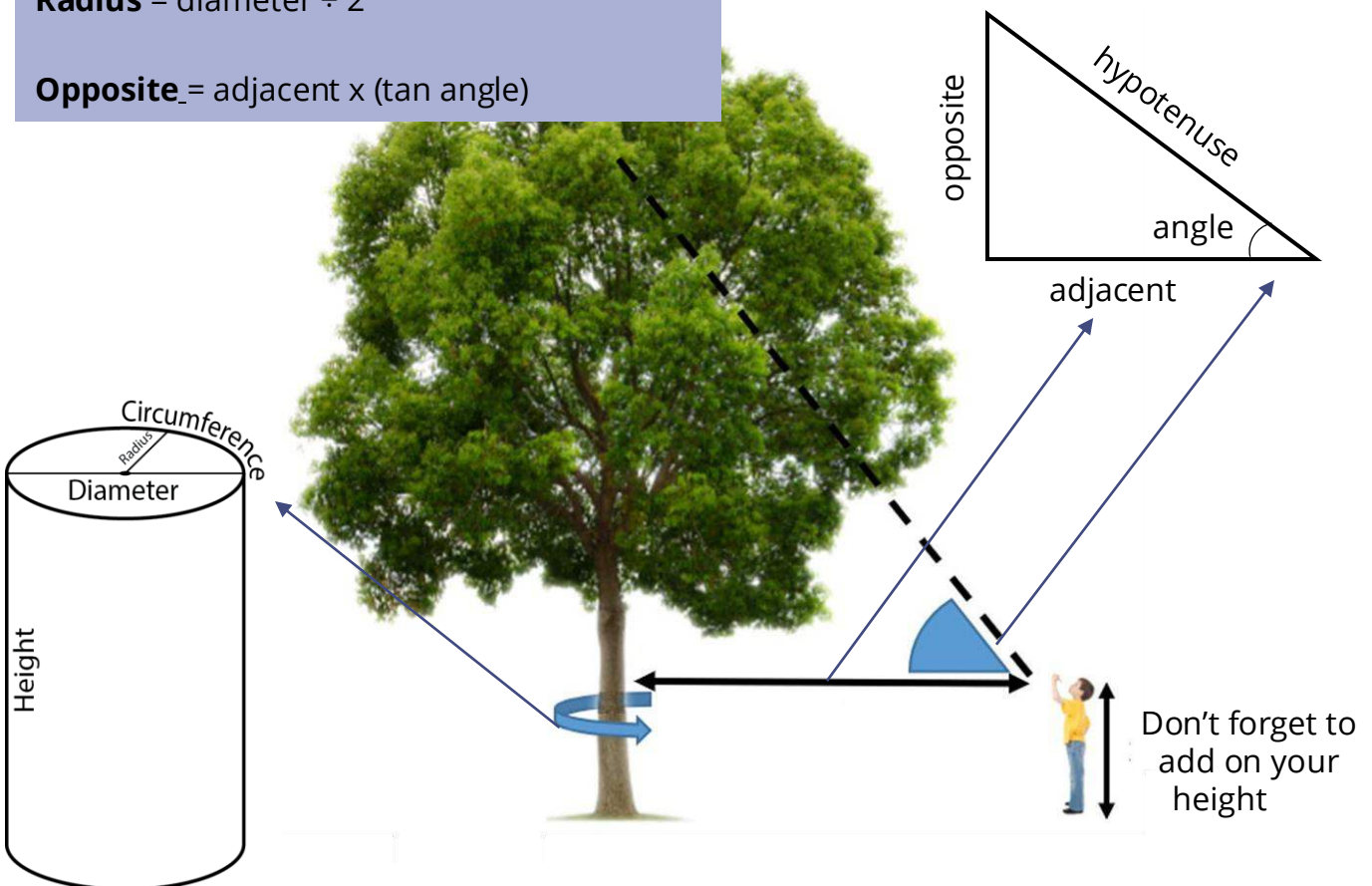
Tree species	Circumference (m) at 140 cm	Distance to tree – adjacent (m)	Angle to the top of trunk	Eye height from ground (m)

Volume of cylinder = $\pi \times \text{radius}^2 \times \text{height}$

Diameter = circumference \div π

Radius = diameter \div 2

Opposite = adjacent \times (tan angle)



Trunk volume = $\pi \times (r^2) \times h$

Trunk volume = $\pi \times (\square^2) \times \square = \underline{\hspace{2cm}}$

Radius = diameter $\div 2 =$ _____

Diameter = circumference $\div \pi =$ _____

Tree height = (adjacent \times (Tan of angle)) + eye height

Tree height = (_____ \times (Tan _____)) + _____ = _____

Use the conversion charts from Zianis *et al.* (2005) to convert the trunk volume and diameter into biomass for trunk, roots and crown

Carbon storage in vegetation is considered to be 50% of total biomass - so to calculate carbon in trees we need to calculate the biomass of its roots, stem and crown.

	Fieldwork measurement (from tree calculations)	Biomass (from chart)	Carbon (biomass/ 2)
Trunk	Volume =		
Roots	Diameter =		
Crown	Diameter =		
Total carbon for the tree we measured =			

Review: How could you use this method to investigate carbon across a wider area?