



Definitions • DBH – tree bole Omit leader from total diameter at breast tree height height (1.37 m or 4.5 ft) measurement. Measure to white • Tree Height – total line. height from ground level to top of tree • Need DBH or DBH and Height to estimate volume and biomass of tree US











What is Needed to Calculate Carbon Storage?

- Need tree dbh or dbh and height (growth)
- Volume or biomass equations
- Wood density (think pine vs. oak)
 - DW Density

US





















Volume and Biomass Equations

- Hundreds in forest literature
- Forest general equations
- 26 common species in urban
 - Apply taxonomically based on form
- Urban general equations

UAS

- Forest
 - Predominantly based on dbh alone
- Forest general
 - Based on mixed hardwood and softwood stands
- Forest most predict biomass, not volume and for merchantable timber



DW Density Varies

Variation:

UAS

- Within the tree
- During the life of the tree
- Between individuals
- Branches and outer bole lighter than pith

Most values today: 10-30 cm trees (<12 in) 10-30 samples (bole) Waist to breast height Global Wood Density Database



	Equations to predict tree volur	ne using DBH only or DBH and Height	
	These predict cubic meters of fresh wood volume.		DW
	Species	New equations SI UNITS	Density
	Acacia longifolia	=0.0283168466(0.01406*(dbhcm/2.54)^2.18649*(3.28*htmet)^0.46736)	510
	Ceratonia siliqua	=0.0283168466(0.00857*(dbhcm/2.54)^1.79584*(3.28*htmet)^0.92667)	520
	Cinnamomum camphora	=0.0283168466(0.00982*(dbhcm/2.54)*2.13480*(3.28*htmet)*0.63404)	520
	Cupressus macrocarpa	=0.0283168466(0.00576*(dbhcm/2.54)*2.26035*(3.28*htmet)*0.63013)	410
D	Eucalyptus globulus	=0.0283168466(0.00309*(dbhcm/2.54)^2.15182*(3.28*htmet)^0.83573)	620
2	Fraxinus velutina 'Modesto'	=0.0283168466(0.00129*(dbhcm/2.54)^1.76296*(3.28*htmet)^1.42782)	510
В	Jacaranda mimosifolia	=0.0283168466(0.01131*(dbhcm/2.54)^2.18578*(3.28*htmet)^0.54805)	490
н	Liquidambar styraciflua	=0.0283168466*(0.01177*(dbhcm/2.54)^2.31582*(3.28*htmet)^0.41571)	460
•	Magnolia grandiflora	=0.0283168466(0.00449*(dbhcm/2.54)^2.07041*(3.28*htmet)^0.84563)	460
	Pinus radiata	=0.0283168466(0.00533*(dbhcm/2.54)^2.22681*(3.28*htmet)^0.66899)	400
а	Pistacia chinensis	=0.0283168466(0.00292*(dbhcm/2.54)*2.19157*(3.28*htmet)*0.94367)	685
n	Platanus acerifolia	=0.0283168466*(0.01043*(dbhcm/2.54)*2.43642*(3.28*htmet)*0.39168)	500
	Quercus ilex	=0.0283168466(0.00431*(dbhcm/2.54)^1.82158*(3.28*htmet)^1.06269)	820
d	Ulmus parvifolia chinensis	=0.0283168466(0.01046*(dbhcm/2.54)*2.32481*(3.28*htmet)*0.49317)	730
н	Zelkova serrata	=0.0283168466(0.00666*(dbhcm/2.54)*2.36318*(3.28*htmet)*0.55190)	520
	Acer platanoides	=0.001011*dbhcm^1.533*htmet^0.657	520
	Acer saccharinum	=0.000238*dbhcm^1.998*htmet^0.596	440
е	Celtis occidentalis	=0.002245*dbhcm^2.118*htmet^(-0.447)	490
	Fraxinus pennsylvanica	=0.000414*dbhcm^1.847*htmet^0.646	530
•	Gleditsia triancanthos	=0.000489*dbhcm^2.132*htmet^0.142	600
g	Gymnocladus dioicus	=0.000463*dbhcm^1.545*htmet^0.792	530
h	Populus sargentii	=0.001906*dbhcm^1.806*htmet^0.134	370
2	Quercus macrocarpa	=0.000169*dbhcm^1.956*htmet^0.842	580
τ	Tilia cordata	=0.000945*dbhcm^1.617*htmet^0.59	420
	Ulmus americana	=0.0012*dbhcm^1.696*htmet^0.405	460
	Ulmus pumila	=0.000338*dbhcm^0.855*htmet^2.041	540
	Urban general for all broadleaf	=0.000196665*dbhcm^1.951853*htmet^0.664255	look u
	Urban general for conifer	=0.0000425661*dbhcm^2.24358*htmet^0.64956	look up













