

Hawaii biomass equations

PNW-FIA estimates total above ground biomass (AGB) similar to the methods described in Asner (2011). Above ground biomass estimates have been converted to pounds. Diameters at breast height (DBH) are measured in inch and tree heights (H) are measured in feet. Species specific wood density constants (WD) are given in grams per cubic centimeter.

Whenever available, the species specific AGB models are used to estimate biomass. If species AGB models are not available or the DBH is above a specific threshold (see below), model E010 is used.

FIA SPCD	PLANTS_Accepted_Name	NRCS_Code	COMMON_NAME	WD (g/cm ³)	AGB model (species)	Valid for DBH
6006	Acacia koa	ACKO	koa	0.55	E001	≤30cm dbh
6546	Cibotium chamissoi	CICH	Chamisso's manfern	0.19	E004	
6547	Cibotium glaucum	CIGL	hapu'u	0.22	E004	
6548	Cibotium menziesii	CIME8	hapu'u li	0.21	E004	
6549	Cibotium spp.	CIBOT	manfern	0.21	E004	
7783	Metrosideros polymorpha	MEPO5	'ohi'a lehua	0.69	E002	≤30cm dbh
7786	Metrosideros polymorpha va	MEPOI2	'ohi'a lehua	0.69	E002	≤30cm dbh
7784	Metrosideros polymorpha va	MEPOD	'ohi'a lehua	0.69	E002	≤30cm dbh
8355	Psidium cattleianum	PSCA	strawberry guava	0.69	E003	≤20cm dbh

Equation

Equation Number	Equation
E001	$AGB = \exp(-2.3270 + 2.3500 \cdot \ln(DBH \cdot 2.54)) \cdot 1.0171 \cdot 2.2046$
E002	$AGB = \exp(-2.1311 + 2.5011 \cdot \ln(DBH \cdot 2.54)) \cdot 1.0671 \cdot 2.2046$
E003	$AGB = \exp(-1.9096 + 2.5763 \cdot \ln(DBH \cdot 2.54)) \cdot 1.0084 \cdot 2.2046$
E004	$AGB = \pi \cdot (DBH \cdot 2.54 / 2)^2 \cdot H \cdot 0.3048 \cdot 100 \cdot WD / 1000 \cdot 2.2046$
E010	$AGB = 2.2046 \cdot 0.0673 \cdot (WD \cdot (DBH \cdot 2.54)^2 \cdot H \cdot 0.3048)^{0.976}$

Reference

Asner, G. P., R. F. Hughes, J. Mascaro, A. L. Uowolo, D. E. Knapp, J. Jacobson, T. Kennedy-Bowdoin, and J. K. Clark. 2011. High-resolution carbon mapping on the million-hectare island of Hawai'i. *Frontiers in Ecology and the Environment* 9:434-439.

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