

Database Code: TP072

Title: Pacific Northwest Plant Biomass Component Equation Library

**Abstract:**

This database contains a collection of regression equations to predict various biomass components for many plants of the Pacific Northwest based on common parameters such as diameter, height, and cover. Documentation, including sources of raw data and source publications, is provided for each equation.

**Keywords:** Allometric equations; Biomass; Plant biomass; Prediction equations; Primary production; allometry; biomass; plant biomass; primary production;

**Date data commenced:** 1961-01-01

**Date data terminated:** 2000-01-01

**Principal Investigator:** Mark E. Harmon

**List of Entities:**

1. Biomass equation library: Equations, coefficients, definitions, and valid ranges
2. Biomass equation library: Documentation of equations in source publications and data
3. Biomass equation library: Additional notes and comments for biomass equations

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**1. Biomass equation library: Equations, coefficients, definitions, and valid ranges**

This table contains the equations ready to use along with definitions for codes in the selection fields and valid parameter ranges.

**Attribute List:**

EQN_NO	Y	N	numeric(4,0)	range	1.0000	1156.0000	number
LIFEFORM	N	N	char(1)	enum			
SPP_CODE	N	N	char(6)	taxa			
SCI_NAME	N	N	varchar(50)	freetext			
COMM_NAME	N	Y	varchar(30)	freetext			
BIO_COMP	N	N	char(3)	enum			
GEO_AREA	N	N	char(1)	enum			
SER_STAG	N	N	char(1)	enum			
TAX_LIFE	N	N	char(1)	enum			
PA1_CODE	N	N	char(3)	enum			
PA1_TEXT	N	N	varchar(50)	freetext			
PA1_MIN	N	Y	numeric(10,3)	range	0.0000	118.9000	number
PA1_MAX	N	Y	numeric(10,3)	range	0.3000	6551.0000	number
PA1_UNIT	N	Y	char(5)	freetext			
PA2_CODE	N	Y	char(3)	enum			
PA2_TEXT	N	Y	varchar(50)	freetext			
PA2_MIN	N	Y	numeric(10,3)	range	0.1000	1829.0000	number
PA2_MAX	N	Y	numeric(10,3)	range	1.0000	4400.0000	number

PA2_UNIT	N	Y	char(5)	freetext			
PA3_CODE	N	Y	char(3)	enum			
PA3_TEXT	N	Y	varchar(50)	freetext			
PA3_MIN	N	Y	numeric(10,3)	range	0.0750	34.0000	number
PA3_MAX	N	Y	numeric(10,3)	range	0.5500	266.0000	number
PA3_UNIT	N	Y	char(5)	freetext			
DEP_VAR	N	N	varchar(50)	freetext			
DPV_MIN	N	Y	numeric(12,2)	range	0.0000	16000000.0000	number
DPV_MAX	N	Y	numeric(12,2)	range	1.2100	65000000.0000	number
DPV_UNIT	N	Y	char(5)	freetext			
CF1	N	N	numeric(18,9)	range	-42000.0000	90000.0000	number
CF2	N	Y	numeric(18,9)	range	-2025.0890	864.1599	number
CF3	N	Y	numeric(18,9)	range	-108.6238	285.3748	number
CF4	N	Y	numeric(18,9)	range	-0.1820	3.0950	number
EQUATION	N	Y	varchar(136)	freetext			

## 2. Biomass equation library: Documentation of equations in source publications and data

This table contains the equations as found in source publications or reported by contacts. The main differences with table 1 are in units (english vs. metric).

### Attribute List:

EQN_NO	Y	N	numeric(4,0)	range	1.0000	1156.0000	number
LIFEFORM	N	N	char(1)	enum			
SPP_CODE	N	N	char(6)	taxa			
SCI_NAME	N	N	varchar(50)	freetext			
COMM_NAME	N	Y	varchar(30)	freetext			
BIO_COMP	N	N	char(3)	enum			
GEO_AREA	N	N	char(1)	enum			
SER_STAG	N	N	char(1)	enum			
DPV_O	N	N	varchar(51)	freetext			
DPV_OMIN	N	Y	numeric(10,3)	range	0.0000	16000.0000	number
DPV_OMAX	N	Y	numeric(10,3)	range	1.1600	650000.0000	number
DPV_OUNIT	N	Y	char(5)	freetext			
IP1_TEXT	N	N	varchar(48)	freetext			
IP1_MIN	N	Y	numeric(10,3)	range	0.0000	22680.0000	number
IP1_MAX	N	Y	numeric(12,3)	range	0.3000	6600000.0000	number
IP1_UNIT	N	Y	char(5)	freetext			

IP2_TEXT	N	Y	varchar(48)	freetext			
IP2_MIN	N	Y	char(8)	freetext			
IP2_MAX	N	Y	numeric(8,3)	range	1.0000	2774.0000	number
IP2_UNIT	N	Y	char(5)	freetext			
IP3_TEXT	N	Y	varchar(48)	freetext			
IP3_MIN	N	Y	numeric(7,3)	range	0.0750	34.0000	number
IP3_MAX	N	Y	numeric(7,3)	range	0.5500	266.0000	number
IP3_UNIT	N	Y	char(5)	freetext			
ORG_EQFM	N	N	varchar(136)	freetext			
SMP_SIZE	N	Y	numeric(4,0)	range	3.0000	867.0000	number
R_SQUARE	N	Y	numeric(5,3)	range	0.0000	1.0000	number
MS_ERROR	N	Y	numeric(14,6)	range	0.0000	4733670.5000	number
SEE	N	Y	numeric(12,6)	range	0.0000	2175.7000	number

### 3. Biomass equation library: Additional notes and comments for biomass equations

This table contains additional information as long text about data sources.

**Attribute List:**

EQN_NO	Y	N	numeric(4,0)	range	1.0000	1156.0000	number
RAW_DATA	N	Y	varchar(156)	freetext			
SRC_EQN	N	N	varchar(234)	freetext			
SRC_DAT	N	Y	text	freetext			

Attributes Definitions:

BIO\_COMP

Code for biomass component estimated by the equation

CF1

First equation coefficient

CF2

Second equation coefficient

CF3

Thrid equation coefficient

CF4

Fourth equation coefficient

COMM\_NAME

Common name of species

DEP\_VAR

Dependent variable in equation

DPV\_MAX

Maximum value of dependent variable

DPV\_MIN

Minimum value of dependent variable

DPV\_O

Dependent variable name in source publication

DPV\_OMAX

Dependent variable maximum in source publication

DPV\_OMIN

Dependent variable minimum in source publication

DPV\_OUNIT

Dependent variable unit in source publication

DPV\_UNIT

Unit of dependent variable

EQN\_NO

Sequential equation number

EQUATION

Explicit equation with coefficients

GEO\_AREA

Code for the geographic area for which the equation is valid

IP1\_MAX

Maximum value of first independent parameter

IP1\_MIN

Minimum value of first independent parameter

IP1\_TEXT

Definition of first independent parameter

IP1\_UNIT

Unit of first independent parameter

IP2\_MAX

Maximum value of second independent parameter

IP2\_MIN

Minimum value of second independent parameter

IP2\_TEXT

Definition of second independent parameter

IP2\_UNIT

Unit of second independent parameter

IP3\_MAX

Maximum value of third independent parameter

IP3\_MIN

Minimum value of third independent parameter

IP3\_TEXT

Definition of third independent parameter

IP3\_UNIT

Unit of third independent parameter

LIFEFORM

Lifeform code (includes K = coppice for some trees and shrubs)

MS\_ERROR

Mean square error

ORG\_EQFM

Original equation form

PA1\_CODE

Code for the first parameter

PA1\_MAX

Maximum value for first parameter

PA1\_MIN

Minimum value for first parameter

PA1\_TEXT

Definition for the first parameter

PA1\_UNIT

Unit of second parameter

PA2\_CODE

Code for the second parameter

PA2\_MAX

Maximum value for second parameter

PA2\_MIN

Minimum value for second parameter

PA2\_TEXT

Definition for the second parameter

PA3\_CODE

Code for the third parameter

PA3\_MAX

Maximum value for third parameter

PA3\_MIN

Minimum value for third parameter

PA3\_TEXT

Definition for the third parameter

PA3\_UNIT

Unit of third parameter

R\_SQUARE

Coefficient of variation

RAW\_DATA

Reference to people owning or locations containing the raw underlying data

SCI\_NAME

Scientific name (binomial) for species

SEE

Sum of squares for error

SER\_STAG

Code for the seral stage for which the equation is valid

SMP\_SIZE

Sample size in underlying data

SPP\_CODE

Species code according to Garrison et al., 1972

SRC\_DAT

Additional notes related to data and equations

SRC\_EQN

Notes and references to people that developed the equations

TAX\_LIFE

Taxonomic lifeform (coppice in lifeform field assigned to tree or shrub)

Enumerated Domains:

Enumerated Domain for Attribute: BIO\_COMP

BIT	Total inflorescence biomass
BFN	New foliage biomass
BFT	Total foliage biomass
PFT	Total projected leaf area
BRL	Total root biomass (live)
BKL	Biomass, coarse roots, live
BST	Total stem biomass
BRT	Biomass, roots, total
BSB	Stem bark biomass
AFN	New all-sided leaf area
AFT	Total all-sided leaf area

BBS	Small branch biomass
BCL	Total live crown biomass
BCD	Dead crown biomass
BBL	Live branch biomass
BAT	Total aboveground biomass
BBD	Dead branch biomass
BAE	Total aboveground biomass (but note more specific definitions in data table)
BAP	Biomass, aboveground, wood plus bark
BAL	Aboveground live biomass
BSW	Stem wood biomass (without bark)
BUN	Nodule biomass, underground
BCT	Biomass, crown, live & dead
VST	Bole volume, bark and wood
HST	Total height
VAE	Volume, aboveground, live and dead wood plus bark
VSB	Gross bark volume
VQW	Wood top volume (but note more specific definitions in data table)
PCH	Projected area, crown, horizontal surface
PFN	New projected leaf area
VSW	Stem wood volume

Enumerated Domain for Attribute: GEO\_AREA

G	General combination of several areas, or unknown
E	East side of the Cascades and eastern OR and WA
C	Coast ranges (BC, WA, OR, northern CA)
R	Rocky mountains
W	West side of Cascades
S	Sierra Nevada
A	Southeast Alaska

Enumerated Domain for Attribute: LIFEFORM

S	Shrub
T	Tree
M	Bryophyte
K	Coppice; lifeform recognized for trees and shrubs because stump sprouts often have different growth form than plants grown from seed.
G	Grass

H	Herb
C	Sedge, rush

Enumerated Domain for Attribute: PA1\_CODE

SPA	Sapwood cross-sectional area
CR	Crown ratio
DBA	Diameter at or near base (but note more specific definitions in data table)
CIR	Circumference
COV	Canopy cover
DBH	Diameter at breast height
BIO	Biomass
HT	Height
VOL	Volume (for example, of bole, or crown)
WID	Width (for example, projected crown width)
NUM	Number (for example, of fronds, of stems, or flowers)
SAP	Sapwood radial thickness
LEN	Length (for example, along stem, projected crown length)

Enumerated Domain for Attribute: PA2\_CODE

SPA	Sapwood cross-sectional area
CR	Crown ratio
DBA	Diameter at or near base (but note more specific definitions in data table)
CIR	Circumference
COV	Canopy cover
DBH	Diameter at breast height
BIO	Biomass
HT	Height
VOL	Volume (for example, of bole, or crown)
WID	Width (for example, projected crown width)
NUM	Number (for example, of fronds, of stems, or flowers)
SAP	Sapwood radial thickness
LEN	Length (for example, along stem, projected crown length)

Enumerated Domain for Attribute: PA3\_CODE

SPA	Sapwood cross-sectional area
CR	Crown ratio
DBA	Diameter at or near base (but note more specific definitions in data table)



CIR	Circumference
COV	Canopy cover
DBH	Diameter at breast height
BIO	Biomass
HT	Height
VOL	Volume (for example, of bole, or crown)
WID	Width (for example, projected crown width)
NUM	Number (for example, of fronds, of stems, or flowers)
SAP	Sapwood radial thickness
LEN	Length (for example, along stem, projected crown length)

Enumerated Domain for Attribute: SER\_STAG

Y	Young (site approaching full occupancy, or site fully occupied; self- thinning occurring; little or no establishment of by later-seral species)
E	Early (recently disturbed sites; reorganizational stage of succession; self- thinning not important; herbs and shrubs are usually dominant)
G	General (combination of several stages, or unknown)
O	Old-growth (original canopy well broken up; late seral species very common and dominating overstory)
M	Mature (significant establishment and growth of later-seral species; canopy of early seral species breaking up)

Enumerated Domain for Attribute: TAX\_LIFE

S	Shrub
T	Tree
M	Bryophyte
K	Coppice; lifeform recognized for trees and shrubs because stump sprouts often have different growth form than plants grown from seed.
G	Grass
H	Herb
C	Sedge, rush

Enumerated Domain for Attribute: BIO\_COMP

BIT	Total inflorescence biomass
BFN	New foliage biomass
BFT	Total foliage biomass
PFT	Total projected leaf area
BRL	Total root biomass (live)
BKL	Biomass, coarse roots, live
BST	Total stem biomass
BRT	Biomass, roots, total
BSB	Stem bark biomass

AFN	New all-sided leaf area
AFT	Total all-sided leaf area
BBS	Small branch biomass
BCL	Total live crown biomass
BCD	Dead crown biomass
BBL	Live branch biomass
BAT	Total aboveground biomass
BBD	Dead branch biomass
BAE	Total aboveground biomass (but note more specific definitions in data table)
BAP	Biomass, aboveground, wood plus bark
BAL	Aboveground live biomass
BSW	Stem wood biomass (without bark)
BUN	Nodule biomass, underground
BCT	Biomass, crown, live & dead
VST	Bole volume, bark and wood
HST	Total height
VAE	Volume, aboveground, live and dead wood plus bark
VSF	Gross bark volume
VQW	Wood top volume (but note more specific definitions in data table)
PCH	Projected area, crown, horizontal surface
PFN	New projected leaf area
VSW	Stem wood volume

Enumerated Domain for Attribute: GEO\_AREA

G	General combination of several areas, or unknown
E	East side of the Cascades and eastern OR and WA
C	Coast ranges (BC, WA, OR, northern CA)
R	Rocky mountains
W	West side of Cascades
S	Sierra Nevada
A	Southeast Alaska

Enumerated Domain for Attribute: LIFEFORM

S	Shrub
T	Tree
M	Bryophyte

K	Coppice; lifeform recognized for trees and shrubs because stump sprouts often have different growth form than plants grown from seed.
G	Grass
H	Herb
C	Sedge, rush

Enumerated Domain for Attribute: SER\_STAG

Y	Young (site approaching full occupancy, or site fully occupied; self- thinning occurring; little or no establishment of by later-seral species)
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