Title: Long-term log decay experiments at the Andrews Experimental Forest, 1985 to 2185

Abstract:

These data are collected from six sites within the H. J. Experimental Forest and are part of a 200-year experiment on the decomposition of logs in a terrestrial environment. The taxa being examined in the experiment are Douglas-fir, western hemlock, western redcedar, and Pacific silver fir. The data start in 1985 and are periodically updated as samples are taken. The last collection of data is planned in 2185. Periodically logs are sampled by measuring their diameters and lengths as well as bark cover and the fraction of their length in contact with the ground. Cross-sections are removed with a chainsaw and dissected with a table saw or other means to determine the density of bark and wood samples. These samples systematically sample each cross-section and can be used to reconstruct the spatial pattern of decomposition. Subsamples are ground and nutrient concentrations are determined to calculate nutrient stores. Twenty one data tables are associated with this study. A general description of the logs (length, diameters, bark cover) is found in td01401 and can be used to estimate how the log has fragmented over time. The areal extent of tissue types (outer bark, inner bark, sapwood, and heartwood) and zones of rotten wood from cross-sections is documented in td01418 and td01419. The position of the pith in each cross-section, a useful indicator of volume loss, is documented in td01420. The density (dry mass/green volume) of samples is documented in td01403 and based on the weights of individual samples (td01404) as well as their dimensions (td01405). The arrangement of samples into transects (top to bottom, left to right) within the cross-sections is documented in td01406. To help explain why some samples may be more dense than others, the area of the sample cross-section covered by knots is documented in td01407 (knots are more decay resistant and of greater density than wood). The radial thickness of inner and outer bark of the undecayed logs is documented in td01409, and can be used to estimate the original thickness of these tissues once extensive decomposition occurs. Given that the outer bark can be quite irregular in shape, water displacement was used to determine the volume of this tissue; these data are documented in td01415. The location of the logs at the six sites is stored in td01413, with distances, slope, and bearing from a series of surveyed posts noted. The cell wall chemistry of samples has been analyzed using the proximate method described by Ryan et al. (td01408) and Van Soest (td01412). The number and type of insect galleries present on logs for the first three years is documented in td01410. The number and species of fungal sporocarps growing on logs in the autumn for the first eight years is documented in td01414. Concentrations of nutrient elements such as nitrogen, phosphorus, calcium, and potassium of dried, ground samples of inner and outer bark, sapwood, and heartwood, as well as fungal sporocarps and insects is stored in td01411. Parameters for regression models derived from these data that describe the temporal pattern of decomposition is stored in td01421.

Keywords: Coarse woody debris; Decay; Decomposition; Invertebrates; Logs; Nurse-logs; Nutrient cycling; Nutrients; Woody debris; Inorganic nutrients; Organic matter; decay rates; decomposition; nutrient cycling; inorganic nutrients; nutrients; woody debris; coarse woody debris; organic matter; invertebrates; logs;

Date data commenced: 1985-03-26

Date data terminated: 2016-08-24

Principal Investigator: Mark E. Harmon

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### Whole Log Descriptions

A general description of the logs (length, diameters, bark cover); used to estimate how the log has fragmented over time

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### 2: Preliminary cross-sectional area of tissue types

The areal extent of tissue types (outer bark, inner bark, sapwood, and heartwood)
### 3. Sample volume, moisture, and density

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### 7. Knot Volume Correction Estimate for Wood Samples

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- **LOG SPECIES**: Y/N char(4) taxa
- **TIME**: Y/N numeric(3,0) range 0.0000 7.0000 years
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- **LIGNINR**: N/Y numeric(6,2) range 20.8700 71.8300 %
- **ACIDSOL**: N/Y numeric(6,2) range 16.1300 71.1600 %
- **NPE**: N/N numeric(6,2) range 0.1900 18.5600 %
- **WSE**: N/N numeric(6,2) range 3.1100 16.2100 %
- **WSSUG**: N/N numeric(6,2) range 0.4300 7.2700 %
- **ASSUG**: N/Y numeric(6,2) range 2.8600 79.6100 %
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#### 9. Radial Bark Thickness

The radial thickness of inner and outer bark of the undecayed logs

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### 11. Nutrient Content of Bark, Wood, Fungal, and Insect Samples

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### 12. Van Soest Cell Wall Chemistry of Wood and Bark Samples

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13. Log Location Survey Notes

Used to Produce Maps

Attribute List:

- **DBCODE** N N char(5) enum
- **ENTITY** N N numeric(2,0) range 13.0000 13.0000 number
- **SITECODE** N Y char(10) place
- **SITE** N N char(1) enum
- **LOGNUM** Y N numeric(3,0) range 1.0000 900.0000 number
- **LOG_SPECIES** N N char(4) taxa
- **POST** Y N char(1) enum
- **BEARING** N N char(4) freetext
- **DIST** N N numeric(6,2) range 1.1000 35.4800 m
- **ANGLE** N N numeric(6,0) range -45.0000 55.0000 deg

14. Sporocarp Counts from Logs

Attribute List:

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- **ENTITY** N N numeric(2,0) range 14.0000 14.0000 number
- **SITECODE** N Y char(10) place
- **LOGNUM** Y N numeric(3,0) range 1.0000 526.0000 number
- **LOG_SPECIES** N N char(4) taxa
- **TIME** Y N numeric(3,0) range 0.0000 7.0000 years
- **YEAR** N N numeric(4,0) range 1985.0000 1992.0000 YYYY
- **SPOROCAR** N N numeric(6,0) range 0.0000 5850.0000 number
- **FUNGI_SPECIES** Y Y char(4) taxa
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### 15. Bark Sample Volumes from Water Displacement

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### 16. Entire cross-section method: data for tissue dimensions, total mass, total volume, and density

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17. Entire cross-section method: data for subsample dimensions, mass, and density
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### 18. Areas of sound and rotten tissues based on digitized photographic slides of cross-sections

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### 19. Computed diameter and areas of sound and rotten tissues based on digitized photographic slides of cross-sections

Derived from digitized data (entity 18)

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20. Polar coordinate (distance and angle) location of pith relative to the outer surface of cross-sections

Distance and angle data for pith to external parts of cross-section. See related file: Idealized cross-section diagram

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21. Decomposition equation summary data

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<td>numeric(5,3) range 0.0000 1.0000 number</td>
<td></td>
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<tr>
<td>INTERCEPT</td>
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<tr>
<td>INTERCEPT_SE</td>
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<td>N Y</td>
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<td></td>
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<tr>
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<td>N Y</td>
<td>numeric(6,4) range 0.0000 1.0000 number</td>
<td></td>
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<td>LAG</td>
<td>N Y</td>
<td>numeric(4,2) range 0.0000 20.0000 number</td>
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<td>LAG_SE</td>
<td>N Y</td>
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<td>R_SQUARED</td>
<td>N N</td>
<td>numeric(8,4) range -0.9955 1.0000 number</td>
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<td>char(1) enum</td>
<td></td>
</tr>
<tr>
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<td>numeric(6,4) range 0.0000 1.0000 number</td>
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<td>N Y</td>
<td>numeric(4,2) range 0.0000 1.0000 number</td>
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<td>N Y</td>
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<tr>
<td>DECAY_RATE_K1</td>
<td>N Y</td>
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<tr>
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<td>Y</td>
<td>numeric(8,3) range 0.0000 10.1000 number</td>
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<tr>
<td>DECAY_RATE_K2</td>
<td>N Y</td>
<td>numeric(5,3) range 0.0000 1.0000 number</td>
<td></td>
</tr>
<tr>
<td>DECAY_RATE_K2_SE</td>
<td>Y</td>
<td>numeric(9,3) range 0.0000 79.1900 number</td>
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<tr>
<td>K1_K2_CORR</td>
<td>N Y</td>
<td>numeric(6,4) range 0.0000 1.0000 number</td>
<td></td>
</tr>
<tr>
<td>K1_P1T0_CORR</td>
<td>N Y</td>
<td>numeric(7,4) range -0.9997 1.0000 number</td>
<td></td>
</tr>
</tbody>
</table>

Attributes Definitions:

ABA

Area of sample for ambrosia beetles

ABG

Number of ambrosia beetle galleries in area
ACIDSOL
Acid soluble carbohydrates, based upon Effland 1977 Tappi 6(100) digestion in 72% sulfuric acid, this is for extractive free wood

ADF
Acid detergent fiber approximates hemicellulose fraction, non extracted wood

AIRAREA
Area of bark in air voids, measured with a wire grid. missing after 1986

AL
Aluminum concentration (icap inductively coupled argon spectrophotometry)

ANGLE
Slope from post to log

ASH
Ash content

ASPECT
Aspect of ground at point of placement. used of log with respect to aspect.

ASSUG
Percent of acid soluble carbohydrates that is sugar, using phenol-sulfuric a

B
Boron concentration (icap inductively coupled argon spectrophotometry)

B_DENSITY
Density of bark based on dry weight and volume

B_VOL
Total bark volume

BA
Bark cross-sectional area including inner and outer

BARK_MISSING
Cover of bark missing on log

BBA
Area of sample for bark bettles

BBG
Number of bark beetle galleries in area

BCIRC_LEN
Circumferential length of bark if present and fragmented

BDIAM
Diameter of x-sec if bark not fragmented

BEARING
Bearing from post to end of log nearest road. The leading letter is the initial cardinal direction, the final letter is off of the starting direction, the number is the number of degrees from the starting direction to the actual bearing. (related file)

BFRAG
Is bark fragmented?

BLONG
  Longitudinal length of bark

BRAD
  Radial thickness of bark

BRANCH
  Number of branches with fresh wounds.

BSS
  Blue-stained sapwood cross-sectional area

BTOT_DRY
  Total dry weight of bark

BTOT_WET
  Total wet weight of bark

CA
  Calcium concentration (icap inductively coupled argon spectrophotometry)

CELL
  Cellulose content, nonextracted wood

COMMENTS_FIELD
  Comments from field data sheets

COMMENTS_LAB
  Comments from lab data sheets

CU
  Copper concentration (icap inductively coupled argon spectrophotometry)

D1
  Dimension in radial direction

D2
  Dimension in tangential direction. If missing then volume calculated using other radial measurement (D1, D3, D4, or volume known).

D3
  Dimension in longitudinal direction, if missing then calculated

D4
  Angle, in degrees, if triangle shape

DBCODE
  FSDB Database code

DD1
  Radial dimension of oven dried piece

DD2
  Tangential dimension of oven dried piece
DE1
   Dimensional end of diameter #1; end regular portion of diameter #1, if different from above

DE2
   Dimensional end of diameter #2; end regular portion of diameter #2, if different from above

DE3
   Dimensional end of diameter #3; end regular portion of diameter #3, if different from above

DECAY_INTERCEPT_CORR
   Correlation between k and intercept parameters used for single exponential model only

DECAY_LAG_CORR
   Correlation between k and lag parameters, used for lag model only

DECAY_RATE
   Decomposition rate-constant (k) estimated parameter

DECAY_RATE_K1
   Decomposition rate-constant for part 1 (k1) estimated parameter for dual exponential

DECAY_RATE_K1_SE
   Standard error of the k1 estimated parameter

DECAY_RATE_K2
   Decomposition rate-constant for part 2 (k2) estimated parameter for dual exponential

DECAY_RATE_K2_SE
   Standard error of the k2 estimated parameter

DECAY_RATE_PV
   p-value of k parameter

DECAY_RATE_SE
   Standard error of decomposition rate-constant estimated parameter

DEN
   Density based on dry weight

DEN1
   Density based on dry wt. and vol 1. this is apparent density including air voids

DEN2
   Density based on dry wt. and vol2. this is actual density for bark

DIAM_END1
   diameter of large end of log

DIAM_END2
   diameter of smaller end of log

DIAM_EST
   estimated diameter from total area

DIAM_MID
diameter of middle of log
DIAM1

diameter of first sample cut
DIAM2

diameter of second sample cut
DIAM3

diameter of third sample cut
DIAM4

diameter of fourth sample cut
DIAM5

diameter of fifth sample cut
DIST

Slope distance to the log from post
DIST_MID

distance to middle of log from large end
DIST1

distance from large end to first sample cut
DIST2

distance from large end to second sample cut
DIST3

distance from large end to third sample cut
DIST4

distance from large end to fourth sample cut
DIST5

distance from large end to fifth sample cut
DRYWT

Dry weight of sample. dried 7 days at 55 degree c
DS1

Dimensional start of diameter #1; start of regular portion of diameter #1, if different from above
DS2

Dimensional start of diameter #2; start of regular portion of diameter #2, if different from above
DS3

Dimensional start of diameter #3; start of regular portion of diameter #3, if different from above
EB1

Wood piece diameter #1 ends on a sequential number of sample position. actual end of #1
EB2

Wood piece diameter #2 ends on a sequential number of sample position. actual end of #2
Wood piece diameter #3 ends on a sequential number of sample position. Actual end of #3

ENTITY
Entity number

EQN_FORM
Defines the model equation used to estimate parameters

EST_DIAM
Log diameter estimated from photo

EXAMDATE
Date the piece was examined. For years 1-4 these are approximate dates.

FE
Iron concentration (icap inductively coupled argon spectrophotometry)

FUNGI_SPECIES
Type of sporocarps analyzed

GD1
Radial dimension of green piece, measurements taken before oven drying (which can cause shrinkage), measured with caliper

GD2
Tangential dimension of green piece, measurements taken before oven drying (which can cause shrinkage)

GD3
Longitudinal dimension of green piece, measurements taken before oven drying (which can cause shrinkage)

GD4
Green dimension angle if shape=4

H_DENSITY
Density of heartwood based on dry weight and volume

H_VOL
Total heartwood volume

HDIAM
Diameter of heartwood

HFRAG
Is heartwood fragmented?

H_LONG
Longitudinal length of heartwood

HRAD
Radial thickness of heartwood

HTOT_DRY
Total dry weight of heartwood

HTOT_WET
Total wet weight of heartwood

HWA

Heartwood cross-sectional area

IB1

Inner bark thickness at top log

IB2

Inner bark thickness at right side of log

IB3

Inner bark thickness at bottom of log

IB4

Inner bark thickness at left side of log

IBA

Inner bark cross-sectional area

INTERCEPT

Intercept estimated parameter

INTERCEPT_FORCED

Intercept forced to be between 0.95 and 1.05 for linear and equal to 1 for lag and dual-exponential equations at time 0 (Y,N)

INTERCEPT_PV

p-value of intercept parameter

INTERCEPT_SE

Standard error of intercept estimated parameter

K

Potassium concentration (icap inductively coupled argon spectrophotometry)

K1_K2_CORR

Correlation between k1 and k2, used for dual exponential model only

K1_P1T0_CORR

Correlation between k1 and proportion of mass for k1 used for dual exponential model only

KNOTVOL

Volume of wood block that is knot

LAB

Code for laboratory responsible for analysis

LAG

Lag estimated parameter

LAG_PV

p-value of lag parameter

LAG_SE

Standard error of lag estimated parameter
LENGTH
  Total log length

LENGTHUP
  Length of log suspended off ground

LIGNINR
  Lignin content based on Effland 1977 Tappi 6(10) lignin is defined as the resid digest at 100 c. this for extract free wood

LIGNINV
  Lignin content, non extracted wood

LOG_SPECIES
  Species of log

LOGNUM
  Number of log

MEANWT
  Mean weight of fungus

MG
  Magnesium concentration (icap inductively coupled argon spectrophotometry)

MN
  Manganese concentration (icap inductively coupled argon spectrophotometry)

MOIST
  Moisture content of sample. calculated from wetwt and drywt

MOSS_COVER
  percent of log covered in moss

N
  Nitrogen concentration (micro Kjeldahl N)

N_OBS
  Number of observations used to estimate model parameters

NA
  Sodium concentration (icap inductively coupled argon spectrophotometry)

NOTES
  measurement notes and assumptions

NPE
  Non polar extractives, dichloromethane (CH2Cl2) in sonicator 90 min

OB1
  Outer bark thickness at top of logs

OB2
  Outer bark thickness at right side of log facing the end

OB3
Outer bark thickness at base of log
OB4

Outer bark thickness at left side of log facing it
OBA

Outer bark cross-sectional area
OD3

Longitudinal dimension of oven dried piece
ORIENT

Compass orientation of log from 90 degree to 270 degree
OVERALL_PV

Significance of the p-value of overall equation
P

Phosphorus concentration (icap inductively coupled argon spectrophotometry)
P1T0

Initial proportion of mass applied to k1 in dual exponential equation
P1T0_SE

Standard error of the P1t0 estimated parameter
PBA

Angle between pith and bottom
PBD

Distance between pith and log bottom
PHOTODATE

Date of photograph in mmddyy format
PIECE

Unique piece number for each section of log measured in a particular site and year. Used for primary key.
PIECENUM

Unique identifier for nutrient content analysis. T, M, B was removed from lognum_nc (now lognum) and put into this field. Used for primary key. Some data appear to be duplicates.
PITH

Block that contains the pith
POSITION

Position on log that sample was taken from
POST

Post survey reading was made form
PS1A

Angle between the pith and the first side
PS1D

Distance between the pith and the 1st side
PS2A
Angle between the pith and 2nd side

PTA
Angle between pith and top

PTD
Distance from pith to top. Note all these readings are used to reference the position of the pith for future reconstructions.

R_SQUARED
r-squared of overall equation

RADPOS
Radial position of sample, for bark the number is zero.

RECTANGLE_TYPE
Shape of the rectangle piece of wood cut from the sample (regular or irregular). May indicate if end piece or not.

RHA
Rotten heartwood cross-sectional area

RSA
Rotten sapwood cross-sectional area

S
Sulfur concentration (icap inductively coupled argon spectrophotometry)

S_DENSITY
Density of sapwood based on dry weight and volume

S_VOL
Total sapwood volume

SAMPLED_SPECIES
Species sampled; includes tree species as well as other species (such as fungi and insects)

SAMPLEDATE
Date of sample processing

SAMPLENUM
Unique sample number for primary key. Based on studyid,lognum,year,Time,subtype.

SAWSET
Indicates if saw was reset during the final cutting. If blank then the saw was set once, a twice, b three times etc

SB1
Wood piece diameter #1 starts on. A sequential number of sample position. Actual start of #1

SB2
Wood piece diameter #2 starts on a sequential number of sample position. Actual start of #2

SB3
Wood piece diameter #3 starts on a sequential number of sample position. Actual start of #3

SCIRC_LEN
Circumferential length of sapwood if present and fragmented

SDIAM
Diameter of x-sec with bark removed

SECTION
Section of log

SEGMENT
Log segment sampled, defined by the two x-sections that form ends example: (see the original sheet)

SFRAG
Is sapwood fragmented?

SHAPE
Dimensional shape of sample taken from cross-section

SITE
Bedding site of log added to

SITECODE
Sampling location

SLONG
Longitudinal length of sapwood

SLOPE
Inclination of the log

SOHWA
Total area of sound (not rotten) heartwood

SOWA
Total area of sound (not rotten) wood

SPOROCAR
Number of sporocarps on log

SRAD
Radial thickness of sapwood

STOT_DRY
Total dry weight of sapwood

STOT_WET
Total wet weight of sapwood

STUDYID
Study identification

SUBNUM
Unique number for each subtype in a given studyid, species, year, time. Used for primary key.

SUBTYPE
Substrate type(e.g. innerbark, heartwood)
SURFAREA
   Surface area of log

SWA
   Sapwood cross-sectional area

TA
   Total cross-sectional area

TANNIN
   Tannin content based upon folin-denis method using tannic acid as a standard

TIME
   Time log has been decaying

TREATMNT
   Treatment of log exclosure, inclosure or control

VOL1
   Volume including air voids, calculated from d1,d2,d3; if missing, d2 and d3 calculated from measurement of end and center pieces

VOL2
   Volume of bark measured by water displacement

VOLUME
   Volume of log

W_RADPOS
   radial position of wedge sample, for bark the number is zero

WA
   Cross-sectional area of wood

WBA
   Area of sample for wood borers

WBG
   Number of wood borer galleries as indicated by larval?

WEIGHT
   Weight of sample (either fresh or over dried. data from electronic digital scale.

WEIGHT_TYPE
   Is sample wet weight or oven dried weight? W=wet weight D= dry weight

WETWT
   Wet weight of sample

WSE
   Water soluble extractives, 3 hours in 100 c water, ryan et al method

WSSUG
   Percent of water soluble matter that is sugar, phenol-sulfuric acid assay

WVOL
Water displacement volume of bark. soaked 48-72 hours before measurement

YEAR
Year of measurement; does not necessarily reflect time decaying in field

ZN
Zinc concentration (icap inductively coupled argon spectrophotometry)

Enumerated Domains:

Enumerated Domain for Attribute: SITE
0 Sample from log at one of study sites (1-6), site unknown originally for knot samples taken from scraps pile at annual harvest
4 W of 350 road near junction of 350 and 1506
3 N of 410 road
5 SW of 354 road
1 End of 327 road
6 1506 road above 350 junction
2 End of 324 road
A All sites combined for summaries

Enumerated Domain for Attribute: TREATMNT
N Control - time series
J Jumbo - large diameter logs (>75 cm)
E Insect exclosure

Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: EST_DIAM
Y Log diameter was estimated from a photo
N No log diameter estimation made

Enumerated Domain for Attribute: SECTION
Y 2nd cross-section from log remnant 1st cross-section from log remnant in 1992
Z 2nd cross section from log remnant in 1992
3 Cross section from year 0, extra section
X 1st cross-section from log remnant
A 1st cross-section from large end 1st sample
1 Cross-section from large end of log - initial sample
2 Cross section from small end of log - initial sample
B 2nd cross-section from large end 1st sample
D 4th cross-section from large end 1st sample
C 3rd cross-section from large end 1st sample
E 5th cross-section from large end 1st sample

F 6th cross-section from large end 1st sample, usually insect enclosure logs

G Partial harvest samples from 1993 full harvest logs collected in 1997

H Partial harvest samples from 1993 full harvest logs collected in 1997

Enumerated Domain for Attribute: STUDYID
COW Coweeta LTER
NBS National Bureau of Standards, standard reference material
CED Cedar Creek LTER
KON Konza LTER
MAC MacDonald forest Corvallis
HJA H.J. Andrews Experimental Forest, Oregon
WWN Wallowa Valley Ranger district, Wallowa Whitman National Forest 25 miles NE Enterprise, Oregon
ALL Material from TD23 LIDET study, see for source

Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: SECTION
Y 2nd cross-section from log remnant 1st cross-section from log remnant in 1992
Z 2nd cross section from log remnant in 1992
3 Cross section from year 0, extra section
X 1st cross-section from log remnant
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1 Cross-section from large end of log - initial sample
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E 5th cross-section from large end 1st sample
F 6th cross-section from large end 1st sample, usually insect enclosure logs
G Partial harvest samples from 1993 full harvest logs collected in 1997
H Partial harvest samples from 1993 full harvest logs collected in 1997

Enumerated Domain for Attribute: SHAPE
1 Rectangular
4 Triangle (pie wedge)

Enumerated Domain for Attribute: SUBTYPE
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>W</td>
<td>Wood standard</td>
</tr>
<tr>
<td>K</td>
<td>Knot wood</td>
</tr>
<tr>
<td>S</td>
<td>Sapwood</td>
</tr>
<tr>
<td>E</td>
<td>Heartwood near log end (terminal)</td>
</tr>
<tr>
<td>I</td>
<td>Inner bark</td>
</tr>
<tr>
<td>H</td>
<td>Heartwood</td>
</tr>
<tr>
<td>3</td>
<td>Wood standard decay class 3</td>
</tr>
<tr>
<td>5</td>
<td>Wood standard decay class 5</td>
</tr>
<tr>
<td>1</td>
<td>Pine needle nbs standard reference material # 1575</td>
</tr>
<tr>
<td>2</td>
<td>Wood standard decay class 2</td>
</tr>
<tr>
<td>M</td>
<td>Mushroom or sporocarp tissues</td>
</tr>
<tr>
<td>O</td>
<td>Outer bark</td>
</tr>
<tr>
<td>A</td>
<td>Arthropod</td>
</tr>
<tr>
<td>T</td>
<td>Transition between sapwood and heartwood</td>
</tr>
<tr>
<td>R</td>
<td>Rotten wood</td>
</tr>
<tr>
<td>L</td>
<td>Leaf sample</td>
</tr>
<tr>
<td>X</td>
<td>Whole log in which all the bark and wood tissues are combined</td>
</tr>
</tbody>
</table>

Enumerated Domain for Attribute: DBCODE
TD014  FSDB Database code TD014

Enumerated Domain for Attribute: SECTION
Y  2nd cross-section from log remnant 1st cross-section from log remnant in 1992
Z  2nd cross section from log remnant in 1992
3  Cross section from year 0, extra section
X  1st cross-section from log remnant
A  1st cross-section from large end 1st sample
1  Cross-section from large end of log - initial sample
2  Cross section from small end of log - initial sample
B  2nd cross-section from large end 1st sample
D  4th cross-section from large end 1st sample
C  3rd cross-section from large end 1st sample
E  5th cross-section from large end 1st sample
F  6th cross-section from large end 1st sample, usually insect enclosure logs
G  Partial harvest samples from 1993 full harvest logs collected in 1997
H  Partial harvest samples from 1993 full harvest logs collected in 1997
Enumerated Domain for Attribute: SUBTYPE
W  Wood standard
K  Knot wood
S  Sapwood
E  Heartwood near log end (terminal)
I  Inner bark
H  Heartwood
3  Wood standard decay class 3
5  Wood standard decay class 5
1  Pine needle nbs standard reference material # 1575
2  Wood standard decay class 2
M  Mushroom or sporocarp tissues
O  Outer bark
A  Arthropod
T  Transition between sapwood and heartwood
R  Rotten wood
L  Leaf sample
X  Whole log in which all the bark and wood tissues are combined

Enumerated Domain for Attribute: WEIGHT_TYPE
D  Dry weight
W  Wet weight

Enumerated Domain for Attribute: DBCODE
TD014  FSDB Database code TD014

Enumerated Domain for Attribute: SECTION
Y  2nd cross-section from log remnant 1st cross-section from log remnant in 1992
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G Partial harvest samples from 1993 full harvest logs collected in 1997
H Partial harvest samples from 1993 full harvest logs collected in 1997

Enumerated Domain for Attribute: SHAPE
  1 Rectangular
  4 Triangle (pie wedge)

Enumerated Domain for Attribute: SUBTYPE
  W Wood standard
  K Knot wood
  S Sapwood
  E Heartwood near log end (terminal)
  I Inner bark
  H Heartwood
  3 Wood standard decay class 3
  5 Wood standard decay class 5
  1 Pine needle nbs standard reference material # 1575
  2 Wood standard decay class 2
  M Mushroom or sporocarp tissues
  O Outer bark
  A Arthropod
  T Transition between sapwood and heartwood
  R Rotten wood
  L Leaf sample
  X Whole log in which all the bark and wood tissues are combined

Enumerated Domain for Attribute: DBCODE
  TD014 FSDB Database code TD014

Enumerated Domain for Attribute: SAWSET
  1 saw was set once
  2 saw was set twice
  3 saw was set three times

Enumerated Domain for Attribute: RECTANGLE_TYPE
  R Regular rectangular shaped piece
  I Irregular rectangular shaped piece
### Enumerated Domain for Attribute: SECTION

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
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</tr>
<tr>
<td>Z</td>
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<tr>
<td>X</td>
<td>1st cross-section from log remnant</td>
</tr>
<tr>
<td>A</td>
<td>1st cross-section from large end 1st sample</td>
</tr>
<tr>
<td>1</td>
<td>Cross-section from large end of log - initial sample</td>
</tr>
<tr>
<td>2</td>
<td>Cross section from small end of log - initial sample</td>
</tr>
<tr>
<td>B</td>
<td>2nd cross-section from large end 1st sample</td>
</tr>
<tr>
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<td>4th cross-section from large end 1st sample</td>
</tr>
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<td>3rd cross-section from large end 1st sample</td>
</tr>
<tr>
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<td>5th cross-section from large end 1st sample</td>
</tr>
<tr>
<td>F</td>
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<tr>
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</tr>
</tbody>
</table>

### Enumerated Domain for Attribute: DBCODE

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TD014</td>
<td>FSDB Database code TD014</td>
</tr>
</tbody>
</table>
Enumerated Domain for Attribute: **STUDYID**

- **COW** Coweeata LTER
- **NBS** National Bureau of Standards, standard reference material
- **CED** Cedar Creek LTER
- **KON** Konza ILTER
- **MAC** MacDonald forest Corvallis
- **HJA** H.J. Andrews Experimental Forest, Oregon
- **WWN** Wallowa Valley Ranger district, Wallowa Whitman National Forest 25 miles NE Enterprise, Oregon
- **ALL** Material from TD23 LIDET study, see for source

Enumerated Domain for Attribute: **SUBTYPE**

- **W** Wood standard
- **K** Knot wood
- **S** Sapwood
- **E** Heartwood near log end (terminal)
- **I** Inner bark
- **H** Heartwood
- **3** Wood standard decay class 3
- **5** Wood standard decay class 5
- **1** Pine needle nbs standard reference material # 1575
- **2** Wood standard decay class 2
- **M** Mushroom or sporocarp tissues
- **O** Outer bark
- **A** Arthropod
- **T** Transition between sapwood and heartwood
- **R** Rotten wood
- **L** Leaf sample
- **X** Whole log in which all the bark and wood tissues are combined

Enumerated Domain for Attribute: **DBCODE**

- **TD014** FSDB Database code TD014

Enumerated Domain for Attribute: **SECTION**

- **Y** 2nd cross-section from log remnant 1st cross-section from log remnant in 1992
- **Z** 2nd cross section from log remnant in 1992
- **3** Cross section from year 0, extra section
- **X** 1st cross-section from log remnant
A 1st cross-section from large end 1st sample
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Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: POSITION
B Bottom
S Side
T Top

Enumerated Domain for Attribute: TREATMNT
N Control - time series
J Jumbo - large diameter logs (>75 cm)
E Insect exclosure

Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: LAB
MMI Micro macro international inc. analytical lab Athens, Georgia
CAL OSU Central analytical laboratory Corvallis, Oregon
HOR OSU Central analytical laboratory Corvallis, Oregon

Enumerated Domain for Attribute: STUDYID
COW Coweeta LTER
NBS National Bureau of Standards, standard reference material
CED Cedar Creek LTER
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X  Whole log in which all the bark and wood tissues are combined

Enumerated Domain for Attribute: DBCODE

TD014  FSDB Database code TD014

Enumerated Domain for Attribute: PIECENUM

B  Bottom
M  Middle
T  Top
1  Piece #1
2  Piece #2
3  Piece #3
4  Piece #4
5  Piece #5
6  Piece #6
7  Piece #7
8  Piece #8
9  Piece #9

Enumerated Domain for Attribute: SAMPLED_SPECIES
OXSP  Oxyporus species
NACA  Naematoloma capnoides
MYOC  Mycena occidentalis
POVE  Polyporus versicolor
HEAB  Hericium abietes
PHTR  Phlebia tremellosus
AMSP  Ampedus spp., mixed species small brown elaterid beetles
BMIX  Buprestis rusticorum and dicerca tenebrosa, mixed buprestid beetles
ALME  Alaus melanops, large eye-spotted elaterid beetle
THUN  Thanasimus undatulus, checkered beetle
DEPS  Dendroctonus pseudotsugae, d.f.bark beetle
FOPI  Fomitopsis pinicola
CHAN  Chalcophora angulicollis, sculptured pine borer, buprestid beetle
BUAU  Buprestis aurulenta, golden buprestid beetle
WSTD  Psme hw wood standard
WST?  Wood standard with questionable values
RHIN  Rhagium inquistor, grey cerambycid beetle
PSM?  Suspect unknown sample, possibly psme
PSTD  Pire pine needle standard
NEMI  Neanthophilax mirificus, red and black cerambycid beetle
CTSP  Ctenicera spp., mixed species small striped elaterid beetles
THPL  Thuja plicata
ABAM  Abies amabilis
PSME  Pseudotsuga menziesii
TSHE  Tsuga heterophylla
QRC  Quercus species
ACSA  Acer saccharum

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Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: SITE
0 Sample from log at one of study sites (1-6), site unknown originally for knot samples taken from scraps pile at annual harvest
4 W of 350 road near junction of 350 and 1506
3 N of 410 road
5 SW of 354 road
1 End of 327 road
6 1506 road above 350 junction
2 End of 324 road
A All sites combined for summaries

Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: POST
A Survey Post A
B Survey Post B
C Survey Post C
D Survey Post D
E Survey Post E
F Survey Post F
G Survey Post G
H Survey Post H
I Survey Post I
J  Survey Post J
K  Survey Post K
L  Survey Post L
M  Survey Post M

Enumerated Domain for Attribute: DBCODE
TD014  FSDB Database code TD014

Enumerated Domain for Attribute: SECTION
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Enumerated Domain for Attribute: DBCODE
TD014 FSDB Database code TD014

Enumerated Domain for Attribute: BFRAG
Y bark is fragmented
N bark is not fragmented

Enumerated Domain for Attribute: SFRAG
Y sapwood is fragmented
N sapwood is not fragmented

Enumerated Domain for Attribute: HFRAG
Y heartwood is fragmented
N heartwood is not fragmented

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Enumerated Domain for Attribute: SHAPE
1 Rectangular
4 Triangle (pie wedge)

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Enumerated Domain for Attribute: W_RADPOS
1 top, sapwood
2 top, heartwood
3 bottom, heartwood
4 bottom, sapwood
5 left, sapwood
6 left, heartwood
7 right, heartwood
8 right, sapwood
0 bark

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TD014 FSDDB Database code TD014

Enumerated Domain for Attribute: EQN_FORM
LAG Modified Chapman-Richards to include lag term: PMR= 1-(1-exp(-k*t))\^Lag
where PRM is proportion of mass remaining, t is time in years, and k and Lag
are the model parameters
SINGLE Single negative exponential: PMR=Int*exp(-k\*t) where PMR is proportion of
mass remaining, t is time in years, and k is the model parameter
DUAL Dual negative exponential: PMR= P1t0*exp(-k1*t) + (1-P1t0)*exp(-k2*t) where
PMR is proportion of mass remaining, P1t0 is the proportion of part 1 at time
zero, t is time in years, and k1 and k2 are the decomposition ra

Enumerated Domain for Attribute: INTERCEPT_FORCED
Y Yes, intercept forced
N No, intercept not forced

Enumerated Domain for Attribute: OVERALL_PV
N P-value not significant (> 0.1)
|  | P-value moderately significant (0.05-0.1) |
|  | P-value significant (<0.05) |
|  | P-value highly significant (<0.01) |