Title: LTER Intersite Fine Litter Decomposition Experiment (LIDET), 1990 to 2002

Abstract:

The primary objective of this study is to examine the control that substrate quality and climate have on patterns of long-term decomposition and nitrogen accumulation in above- and below-ground fine litter. Of particular interest will be to examine the degree these two factors control the formation of stable organic matter and nitrogen after extensive decay.

Keywords: Carbon; Decay rates; Decomposition; Fine roots; Leaf litter; Litterfall; Nitrogen; Phosphorus; Roots; Wood; Inorganic nutrients; Organic matter; decay rates; decomposition; litterfall; inorganic nutrients; wood; carbon; nitrogen; phosphorus; organic matter; roots; fine roots; leaf litter;

Date data commenced: 1990-01-31

Date data terminated: 2007-06-12

Principal Investigator: Mark E. Harmon

List of Entities:

1. Initial Mass of Litter
2. NIR Nitrogen, Lignin, and Cellulose Contents
3. Wet Chemical Data of Litter Subsamples
4. Monthly Temperature and Precipitation at Sites
5. Descriptions of the Soils for the Study Sites
6. Site Descriptions, Elevations, Climate, and Vegetation
7. Moisture Correction Factors
8. Workfile of long_term intersite decomposition experiment
9. Mass loss datafile
10. Ash Content
11. Nutrient Concentrations of Leaves, Roots, and Dowels
12. ANGE Root Initial Ash Correction
13. Nitrogen concentration data

1: Initial Mass of Litter

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### 11. Nutrient Concentrations of Leaves, Roots, and Dowels

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12. ANGE Root Initial Ash Correction
### 13. Nitrogen concentration data

#### Attribute List:

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**Attributes Definitions:**

- **ACIDSOL**
  Acid soluble extractives

- **AET**
  The site mean actual evapotranspiration, this is for the general area and not the specific location of the litter bags.
AF_F_NITRO
Percent final ashfree nitrogen content of individual sample after incubation

AF_I_NITRO
Percent initial ashfree nitrogen content of individual sample

AL
Aluminum concentration (icap inductively coupled argon spectrophotometry)

ANALY_DATE
Date the analysis was performed

ASCARB
Percent acid soluble carbohydrates as measured by ryan et al. method.

ASH
Percent of sample that was composed of ash

ASHFREE
Proportion of sample that was ash free

B
Boron concentration (icap inductively coupled argon spectrophotometry)

BATCH
Batch number that represents whether a sample run was repeated or not.

BIOME
The biome represented by the site, based on Whittaker, 1975

CA
Calcium concentration (icap inductively coupled argon spectrophotometry)

CARBON
Carbon content

COMMENT
Coded comments

CRASH
Weight of crucible and ash. Ashing was at 400 c for 4 hours

CRSWT
Weight of the crucible and sample

CRWT
Crucible weight prior to adding sample

CU
Copper concentration (icap inductively coupled argon spectrophotometry)

DATEIN
The date the litter bag was harvested from the field.

DATEOUT
The date the bags were placed out in the field.

DUP
Indicates if a sample measurement was repeated to check measurements.

DURATION
The length of time (number of years) the litter will remain on site before it is harvested.

ELEV
The site elevation

ENDYR
The year the record ended

EST
Indicates if a pooled sampled was used to estimate the ashfree content. all weights are blank for this condition.

F_N_CONT
Final nitrogen content \(((AF\_F\_NITRO/100)\times FAFW)\)

F_NITRO
Percent final nitrogen content of individual sample after incubation

FAFW
Final ash free weight \((fow\times fash)\)

FASH
Percent final ash content of individual sample after incubation

FE
Iron concentration (icap inductively coupled argon spectrophotometry)

FILL_DATE
Date the bags were filled with litter

FLAG
Flag for outliers

FORMAT
Entity number

FOW
The final oven dry weight (55 deg C) of the litter bag contents.

FWW
The final wet weight of the litter bag contents.

HLZ
The Holdridge life zone represented by the site.

I_ASH_MASS
Initial ash mass (see documentation for description of why this is needed) \((fow\times(fash/100))\) assumption: final ash mass = initial ash mass

I_N_CONT
Initial nitrogen content \(((AF\_I\_NITRO/100)\times IAFW)\)
I_NITRO
Percent initial nitrogen content of individual sample

I_RT_MASS
Initial root mass (iodw-initial ash mass)

IADW
The initial air dry weight of the contents of the litterbag, or dowel

IADW1
Wooden dowel variable, initial air dry weight for above or below part of dowel (applies only to type A or B)

IAFW
Initial ash free weight (iodw*iash)

IASH
Percent initial ash content

ID_NR
The database record number, it serves as an identical relation variable when updating the database.

IODW
The initial oven dry weight

IODW1
Wooden dowel variable, initial oven dry weight for above or below part of dowel (applies only to type A or B)

K
Potassium concentration (icap inductively coupled argon spectrophotometry)

KAFW
Decay rate ash free weight basis (fafw/iafw)

KDW
Decay rate dry weight basis iow/fow

LAB
Laboratory name where analysis was performed

LATDEG
The site latitude in degrees. All are north latitudes

LATMIN
The site latitude in minutes

LENGTH
The length of wooden dowels, the sum of above and below length should be 61.0 cm

LIGNIN
Lignin as measured by Ryan et al method.

LOCATION
Site location description

LONGDEG
The site longitude in degrees, all are west longitude.

LONGMIN
The site longitude in minutes

MAXTEMP
Mean monthly maximum temperature

MCF
Moisture correction factor: mcf=dry wt./wet weight

MEANTEMP
The mean monthly air temperature

MEAS_MONTH
The month value was collected. January=1 ... December=12

MESH
The mesh size of the bag. for leaves this corresponds to the top side of the bag; all the bottoms were 0.1 mm for leaves.

MG
Magnesium concentration (icap inductively coupled argon spectrophotometry)

MINTEMP
Mean minimum temperature for the month

MN
Manganese concentration (icap inductively coupled argon spectrophotometry)

N
Nitrogen concentration (micro Kjeldahl N)

N_CONC
Nitrogen concentration/proportion remaining after incubation (F_N_CONT / I_N_CONT)

NA
Sodium concentration (icap inductively coupled argon spectrophotometry)

NEW_IASH
New percent initial ash content (i_ash_mass/total initial mass)

NIR_ASH
Percent ash as predicted by near infra-red reflectance method

NIR_ASHFRE
Ashfree proportion as predicted by near infra-red reflectance method

NIR_EST
Indicates if prediction is estimated from pooled sample or other rep.

NIR_LAB
Laboratory name where nir analysis was performed

NIR_LIGNIN
Total lignin as measured by near infra-red reflectance method.
NIR_N
  Total nitrogen as measured by near infra-red reflectance method.

NIR_NPE
  Non-polar extractives as measured by near infra-red reflectance method.

NIR_NUM
  Unique sample number

NIR_PAFNN
  Percent ashfree nir nitrogen (nitrogen/ashfree proportion)

NIR_TANNIN
  Tannin as measured by near infra-red reflectance method

NIR_WSCARB
  Water soluable sugars as measured by near infra-red reflectance method

NITROGEN
  Total nitrogen as measured by kjeldahl method.

NPE
  Non-polar extractives

NUMBER
  Accounts for mistakes in recording of tag number

P
  Phosphorus concentration (icap inductively coupled argon spectrophotometry)

PAFRM
  Percent ash free remaining mass (fafw/iafw)

PET
  The site potential evapotranspiration

PRECIP
  The site mean annual precipitation, this is for general area not specific location of the litter bags.

PRECIPTM
  The total precipitation for the month

PRM
  Percent remaining mass

REP
  Replicate code

S
  Sulfur concentration (icap inductively coupled argon spectrophotometry)

SAMPLEDATE
  Date of sampling

SITE
Site code
SITENAME
   Full description name of site
SPECIES
   Litter species code
STARTDATE
   Date experiment started
STARTYR
   The year the record started
STCODE
   Database code
STRR
   The string and rep that the bag number was initially supposed to go on.
TAG_NUM
   The tag number on the litter bag
TANNIN
   Tannin measured against tannic acid standard using denis-folin reagent
TEMPP
   The site mean annual temperature, this is for general area not specific location of the litter bags.
TIMEOUT
   Time in years that litter sample incubated in field
TYPE
   The substrate of the litter : leaves, roots, wood
TYPE1
   The substrate of the litter: leaves, roots, wood
VEG
   The dominant species- veg. type where the litterbags were placed .
WHERE_GO
   Where the bag actually went instead of the initially planned string
WS
   Water soluble extractives
WSCARB
   Percent water soluble carbohydrates as measured by ryan et al. method.
ZN
   Zinc concentration (icap inductively coupled argon spectrophotometry)

Enumerated Domains:
Enumerated Domain for Attribute: REP
   1         Indicates replicate 1
2 Indicates replicate 2
3 Indicates replicate 3
4 Indicates replicate 4
P Indicates pooled sample
I Indicates initial sample of original material
0 Indicates unused extra sample
5 Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023 FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE
A Above part of wooden dowels
B Below part of wooden dowels
L Leaves
M Mineral soil
R Fine roots
W Wooden dowels

Enumerated Domain for Attribute: COMMENT
X Bag torn with obvious sample loss
T Bag torn with sample loss unknown
U Tag disconnected; id questionable
F Foreign material in sample (i.e. rocks)
M Sample missing
D Tag disconnected; id good
XF Torn bag with sample loss and foreign material
TF Torn bag sample loss unknown and foreign material
TU Torn bag and tag disconnected
TD Torn bag loss unknown; id good
TFU Torn bag with foreign material tag disconnected; id questionable
TX Torn bag with obvious sample loss
UF Tag disconnected; id questionable plus foreign material
UT Tag disconnected; id questionable and torn bag
UX Tag disconnected; id questionable and torn bag with obvious sample loss
XFU Torn bag with sample loss and foreign material plus tag disconnected
FLA Flagged as outlier
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<tr>
<td>XE</td>
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<td>SP2</td>
<td>Species was coded as PIEL2</td>
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Enumerated Domain for Attribute: DUP
1  First sample
2  2nd repeated sample
3  3rd repeated sample
4  4th repeated sample

Enumerated Domain for Attribute: LAB
MBL  Marine Biological Laboratory
OSU  Oregon State University
CAL  Central Analytical Lab, OSU Soil & Horticulture dept.
UMD  University of Minnesota, Duluth
UNH  University of New Hampshire
MMI  Micro-macro International, Athens, GA

Enumerated Domain for Attribute: REP
1  Indicates replicate 1
2  Indicates replicate 2
3  Indicates replicate 3
4  Indicates replicate 4
P  Indicates pooled sample
I  Indicates initial sample of original material
0  Indicates unused extra sample
5  Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023  FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE
A  Above part of wooden dowels
B  Below part of wooden dowels
L  Leaves
M  Mineral soil
R  Fine roots
W  Wooden dowels

Enumerated Domain for Attribute: BATCH
1  Sample run only once
2  Sample run is second run of the same sample

Enumerated Domain for Attribute: DUP
1  First sample
2  2nd repeated sample
3  3rd repeated sample
4  4th repeated sample

Enumerated Domain for Attribute: LAB
MBL  Marine Biological Laboratory
OSU  Oregon State University
CAL  Central Analytical Lab, OSU Soil & Horticulture dept.
UMD  University of Minnesota, Duluth
UNH  University of New Hampshire
MMI  Micro-macro International, Athens, GA

Enumerated Domain for Attribute: REP
1  Indicates replicate 1
2  Indicates replicate 2
3  Indicates replicate 3
4  Indicates replicate 4
P  Indicates pooled sample
I  Indicates initial sample of original material
0  Indicates unused extra sample
5  Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023  FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE1
A  Above part of wooden dowels
B  Below part of wooden dowels
L  Leaves
M  Mineral soil
R  Fine roots
W  Wooden dowels
G  Green Leaves
H  Brown Leaves

Enumerated Domain for Attribute: MEAS_MONTH
01  January
02  February
03  March
04  April
05  May
06  June
07  July
08  August
09  September
10  October
11  November
12  December

Enumerated Domain for Attribute: STCODE
TD023  FSDB Database Code TD023

Enumerated Domain for Attribute: REP
1  Indicates replicate 1
2  Indicates replicate 2
3  Indicates replicate 3
4  Indicates replicate 4
P  Indicates pooled sample
I  Indicates initial sample of original material
0  Indicates unused extra sample
5  Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023  FSDB Database Code TD023

Enumerated Domain for Attribute: BIOME
BTF  Boreal-taiga forests, includes subalpine forests
CSDS  Cool semi-desert shrub
TDF  Temperate decidous forest
TEF  Temperate evergreen forest
TGS  Temperate short grass
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<td>Tropical elfinwood-cloud forest</td>
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<td>Warm semidesert shrub</td>
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</table>

**Enumerated Domain for Attribute: HLZ**

- AMT  | Alpine moist tundra
- AWT  | Alpine wet tundra
- BMF  | Boreal moist forest
- BRF  | Boreal rain forest
- CTDB | Cool temperate desert bush
- CTRF | Cool temperate rain forest
- CTS  | Cool temperate steppe
- CTWF | Cool temperate wet forest
- LMWF | Lower montane wet forest
- SAMF | Subalpine moist forest
- SPDT | Subpolar dry tundra
- TDF  | Tropical dry forest
- TMF  | Tropical moist forest
- TRF  | Tropical rain forest
- WTDB | Warm temperate desert brush
- WTDF | Warm temperate dry forest
- WTTW | Warm temperate thorn woodland
- WTWF | Warm temperate wet forest

**Enumerated Domain for Attribute: STCODE**

- TD023 | FSDB Database Code TD023

**Enumerated Domain for Attribute: TYPE**
A  Above part of wooden dowels  
B  Below part of wooden dowels  
L  Leaves  
M  Mineral soil  
R  Fine roots  
W  Wooden dowels  

Enumerated Domain for Attribute: COMMENT  
X  Bag torn with obvious sample loss  
T  Bag torn with sample loss unknown  
U  Tag disconnected; id questionable  
F  Foreign material in sample (i.e. rocks)  
M  Sample missing  
D  Tag disconnected; id good  
XF  Torn bag with sample loss and foreign material  
TF  Torn bag sample loss unknown and foreign material  
TU  Torn bag and tag disconnected  
TD  Torn bag loss unknown; id good  
TFU  Torn bag with foreign material tag disconnected; id questionable  
TX  Torn bag with obvious sample loss  
UF  Tag disconnected; id questionable plus foreign material  
UT  Tag disconnected; id questionable and torn bag  
UX  Tag disconnected; id questionable and torn bag with obvious sample loss  
XFU  Torn bag with sample loss and foreign material plus tag disconnected  
FLA  Flagged as outlier  
FLA  Flagged outlier  
E  Estimated length  
TE  Torn mesh sample loss unknown; estimated length  
XE  Torn mesh with sample loss; estimated length  
SP1  Species was coded as PIEL1  
SP2  Species was coded as PIEL2  

Enumerated Domain for Attribute: REP  
1  Indicates replicate 1  
2  Indicates replicate 2  
3  Indicates replicate 3
4 Indicates replicate 4
P Indicates pooled sample
I Indicates initial sample of original material
0 Indicates unused extra sample
5 Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023 FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE
A Above part of wooden dowels
B Below part of wooden dowels
L Leaves
M Mineral soil
R Fine roots
W Wooden dowels

Enumerated Domain for Attribute: TYPE1
A Above part of wooden dowels
B Below part of wooden dowels
L Leaves
M Mineral soil
R Fine roots
W Wooden dowels
G Green Leaves
H Brown Leaves

Enumerated Domain for Attribute: COMMENT
X Bag torn with obvious sample loss
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M Sample missing
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FLA Flagged as outlier
FLA Flagged outlier
E Estimated length
TE Torn mesh sample loss unknown; estimated length
XE Torn mesh with sample loss; estimated length
SP1 Species was coded as PIEL1
SP2 Species was coded as PIEL2

Enumerated Domain for Attribute: FLAG
X Flagged as outlier

Enumerated Domain for Attribute: REP
1 Indicates replicate 1
2 Indicates replicate 2
3 Indicates replicate 3
4 Indicates replicate 4
P Indicates pooled sample
I Indicates initial sample of original material
0 Indicates unused extra sample
5 Indicates replicate 5

Enumerated Domain for Attribute: STCODE
TD023 FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE
A Above part of wooden dowels
B Below part of wooden dowels
L Leaves
M Mineral soil
R Fine roots
W Wooden dowels

Enumerated Domain for Attribute: TYPE1
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Above part of wooden dowels</td>
</tr>
<tr>
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</tr>
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<td>Leaves</td>
</tr>
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<td>R</td>
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<tr>
<td>W</td>
<td>Wooden dowels</td>
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<tr>
<td>G</td>
<td>Green Leaves</td>
</tr>
<tr>
<td>H</td>
<td>Brown Leaves</td>
</tr>
</tbody>
</table>

Enumerated Domain for Attribute: **ASH_LAB**

OSU Oregon State University

Enumerated Domain for Attribute: **COMMENT**

<table>
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<th>Symbol</th>
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<tbody>
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<td>SP2</td>
<td>Species was coded as PIEL2</td>
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</table>
Enumerated Domain for Attribute: EST
E  Indicates a pooled sample was used to estimate the ashfree proportion.
BLANK Indicates actual sample was ashed
?  Indicates questional sample, may have been lost
P  Indicates pooled sample

Enumerated Domain for Attribute: NIR_EST
E  Indicates a pooled sample was used to estimate an ash free portion
BLANK Indicates actual sample was ashed

Enumerated Domain for Attribute: NIR_LAB
OSU  Oregon state university nir lab

Enumerated Domain for Attribute: REP
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Enumerated Domain for Attribute: STCODE
TD023  FSDB Database Code TD023

Enumerated Domain for Attribute: TYPE
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W  Wooden dowels

Enumerated Domain for Attribute: LAB
MBL  Marine Biological Laboratory
OSU  Oregon State University
CAL  Central Analytical Lab, OSU Soil & Horticulture dept.
UMD  University of Minnesota, Duluth
UNH  University of New Hampshire
MMI  Micro-macro International, Athens, GA
Enumerated Domain for Attribute: REP
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