

Database Code: SP004

**Title:**Seasonal relationships between soil respiration and water-extractable carbon as influenced by soil temperature and moisture in forest soils of the Andrews Experimental Forest, 1992-1993

**Abstract:**

The overall objective of this study is to model trace gas emissions from forest soils of the H. J. Andrews Experimental Forest. This is to be accomplished by studying trace gas emissions and related variable at a set of 20 permanent plots at the HJA.

**Keywords:**Carbon;Carbon storage;Long-Term Ecological Research (LTER);Microclimate;Micrometeorology;Soil chemistry;Soil respiration;Inorganic nutrients;Inorganic nutrients;Organic matter;Long-Term Ecological Research (LTER);meteorology;soil chemistry;microclimate;soil respiration;respiration;carbon cycling;inorganic nutrients;carbon;

**Date data commenced:**1992-07-12

**Date data terminated:**1993-07-07

**Principal Investigator:**Robert P. Griffiths

**List of Entities:**

1. Soil Characteristics and Microbial Variables - Full set
2. Soil Characteristics and Microbial Variables - Routine set
3. Field Respiration
4. Air and Soil Temperature
5. Site Location and Description

1. Soil Characteristics and Microbial Variables - Full set

**Attribute List:**

STCODE	N	N	char(10)	enum			
FORMAT	N	N	numeric(1,0)	range	1.0000	1.0000	number
SITE	Y	N	char(5)	enum			
DATE	Y	N	datetime	range	7/13/1992	7/7/1993 12:00:00 AM 12:00:00 AM	YYYY-MM-DD
SAMPLOCA	Y	N	char(2)	freetext			
PH	N	Y	numeric(5,2)	range	3.6000	5.9400	ph
P_MOIST	N	Y	numeric(5,1)	range	17.6000	200.3000	%
F_DRY_WT	N	Y	numeric(5,3)	range	0.3330	0.8500	number
SOM	N	Y	numeric(5,1)	range	7.4000	89.3000	%
EXTR_AMM	N	Y	numeric(6,3)	range	0.0000	4.9650	ug/g
MIN_N	N	Y	numeric(6,2)	range	2.5000	147.8200	ug/g
DOC_SOIL	N	Y	numeric(6,1)	range	0.3000	787.2000	ug/g
LAB_RESP	N	Y	numeric(6,3)	range	0.0030	1.8530	umol/g*hr
N2OCONS	N	Y	numeric(6,3)	range	-0.4380	3.5800	nmol/g*day
METHCONS	N	Y	numeric(5,2)	range	-0.0600	7.3600	nmol/g*hr
DENITPOT	N	Y	numeric(6,3)	range	0.0300	127.2900	nmol/g*hr

METHPROD	N	Y	numeric(5,2)	range	0.1200	5.0500	nmol/g*hr
FLD_RESP	N	Y	numeric(5,2)	range	0.0900	3.3500	g/m2*day
LIT_RESP	N	Y	numeric(5,2)	range	0.0000	2.1800	g/m2*day
LIT_RESP_P	N	Y	numeric(6,2)	range	0.0000	140.0600	%
BULKDENS	N	Y	numeric(5,2)	range	0.0800	1.0200	g/cm3
MASS_LIT	N	Y	numeric(5,2)	range	0.6600	25.8000	kg/m2
AIRTEMP	N	Y	numeric(5,1)	range	5.5000	31.0000	deg c
SOILTEMP	N	Y	numeric(5,1)	range	8.5000	19.5000	deg c

## 2. Soil Characteristics and Microbial Variables - Routine set

### Attribute List:

STCODE	N	N	char(10)	enum			
FORMAT	N	N	numeric(1,0)	range	2.0000	2.0000	number
SITE	Y	N	char(5)	enum			
DATE	Y	N	datetime	range	7/7/1992 12:00:00 AM	12/23/1993 12:00:00 AM	YYYY-MM-DD
SAMPLOCA	Y	N	char(2)	freetext			
P_MOIST	N	Y	numeric(5,1)	range	3.5000	408.8000	%
F_DRY_WT	N	Y	numeric(5,3)	range	0.3150	0.9660	number
SOM	N	Y	numeric(5,1)	range	0.0000	89.4000	%
DOC_SOIL	N	Y	numeric(6,1)	range	-3.0000	4053.0000	ug/g
LAB_RESP	N	Y	numeric(6,3)	range	-0.2600	4.5560	umol/g*hr
AIRTEMP	N	Y	numeric(5,1)	range	-0.7000	31.8000	deg c
SOILTEMP	N	Y	numeric(5,1)	range	-0.2000	19.8000	deg c

## 3. Field Respiration

### Attribute List:

STCODE	N	N	char(10)	enum			
FORMAT	N	N	numeric(1,0)	range	3.0000	3.0000	number
SITE	Y	N	char(5)	enum			
RESPDATETIME	Y	N	datetime	range	7/13/1992 11:20:00 AM	12/23/1993 12:00:00 AM	YYYY-MM-DD hh:mm:ss
SAMPLE	Y	N	char(2)	freetext			
TREATMNT	Y	Y	char(1)	enum			
NET_RESP	N	Y	numeric(5,2)	range	-0.9700	18.4400	g/m2*day

## 4. Air and Soil Temperature

### Attribute List:

STCODE	N	N	char(10)	enum			
FORMAT	N	N	numeric(1,0)	range	4.0000	4.0000	number
SITE	Y	N	char(5)	enum			
DATE	Y	N	datetime	range	7/7/1992 12:00:00 AM	11/27/1993 12:00:00 AM	YYYY-MM-DD
AIRTEMP	N	Y	numeric(5,1)	range	-0.7000	32.5000	deg C
SOILTEMP	N	Y	numeric(5,1)	range	-0.2000	26.0000	deg C
AIRMAX	N	Y	numeric(5,1)	range	0.6000	36.7000	deg C
AIRMIN	N	Y	numeric(5,1)	range	-1.1000	17.2000	deg C

### 5. Site Location and Description

**Attribute List:**

STCODE	N	N	char(10)	enum			
FORMAT	N	N	numeric(1,0)	range	5.0000	5.0000	number
SITE	Y	N	char(5)	enum			
CONTROL	N	Y	char(10)	freetext			
ASPECT	N	N	char(10)	enum			
MAP_ELEV	N	N	numeric(4,0)	range	473.0000	1433.0000	m
LATITUDE	N	N	numeric(13,6)	range	44.2000	44.2800	deg lat-lon
LONGITUDE	N	N	numeric(13,6)	range	-122.2400	-122.1200	deg lat-lon
VEG	N	N	char(10)	enum			
STANDAGE	N	Y	char(10)	enum			
COMMENTS	N	N	varchar(60)	freetext			

Attributes Definitions:

**AIRMAX**

Maximum air temperature during field respiration

**AIRMIN**

Minimum air temperature during field respiration

**AIRTEMP**

Mean of air temperatures taken at the start and end of field respiration

**ASPECT**

Aspect description

**BULKDENS**

Bulk density of soil

**COMMENTS**

Site description and comments

**CONTROL**

Control site for given site code - if any

DATE

Date samples collected (yyyymmdd)

DENITPOT

Denitrification potential

DOC\_SOIL

Dissolved organic carbon extracted from soils (as C)

EXTR\_AMM

Concentration of ammonium n extracted with 2m KCl

F\_DRY\_WT

Wt fraction dry/wet wt soil

FLD\_RESP

Forest floor respiration (g CO<sub>2</sub>)

FORMAT

Entity number

LAB\_RESP

CO<sub>2</sub> released from soils incubated at 15 deg. C

LATITUDE

Site latitude decimal degrees

LIT\_RESP

Litter respiration (g CO<sub>2</sub>)

LIT\_RESP\_P

Percent litter respiration

LONGITUDE

Site longitude decimal degrees

MAP\_ELEV

Site elevation from gis map

MASS\_LIT

Mass of litter on a square meter basis

METHCONS

Methane consumption rates from soils

METHPROD

Methane production

MIN\_N

Concentration ammonium n after incubation at 40 deg. C for 7 days

N2OCONS

Nitrous oxide consumed by soils

NET\_RESP

Net respiration rate (as C)

P\_MOIST

Percent moisture (wet-dry/dry)x100

PH

pH

RESPDATETIME

Date and time respiration started

SAMPLE

Sample location number along transect at each site

SAMPLOCA

Location along transect where sample is taken

SITE

Permanent trace gas sites

SOILTEMP

Mean of soil temperatures taken at the start and end of field respiration

SOM

Percent soil organic matter in mineral soil (by combustion at 550 C)

STANDAGE

Standage description, OG=old-growth, CC=clearcut, or age in years

STCODE

Database code

TREATMNT

Treatment code: N=no treatment P=mineral soil respiration eliminated by plastic sheet between mineral soil and litter

VEG

Primary tree vegetation

Enumerated Domains:

Enumerated Domain for Attribute: SITE

10C	Mid-elevation (south slope)
11C	Riparian area
1C	1v control + high hot dry mc
1V	High hot dry microclimate (mc)
2C	North facing
2V	North facing clear cut (mid-elevation)
2VC	Control for 2v and 3v
3C	Valley site near stream (no slope)
3V	15 year old doug-fir stand

4C	Cool-wet high elevation (north slope) control for 6v.
4V	35 year old doug-fir stand
4VC	Control for 4v
5C	Site similar to 3c but higher
5V	Big-leaf maple site
5VC	Control for 5v
6C	High-moisture site (north facing)
6V	Sitka alder veg. site
7C	Moisture mid-elevation (north facing veg. site)
8C	High dry hot site (south facing ridge top)
9C	Low elevation (north slope) cool moisture

Enumerated Domain for Attribute: STCODE  
 SP004 FSDDB Database Study Code

Enumerated Domain for Attribute: SITE

10C	Mid-elevation (south slope)
11C	Riparian area
1C	1v control + high hot dry mc
1V	High hot dry microclimate (mc)
2C	North facing
2V	North facing clear cut (mid-elevation)
2VC	Control for 2v and 3v
3C	Valley site near stream (no slope)
3V	15 year old doug-fir stand
4C	Cool-wet high elevation (north slope) control for 6v.
4V	35 year old doug-fir stand
4VC	Control for 4v
5C	Site similar to 3c but higher
5V	Big-leaf maple site
5VC	Control for 5v
6C	High-moisture site (north facing)
6V	Sitka alder veg. site
7C	Moisture mid-elevation (north facing veg. site)
8C	High dry hot site (south facing ridge top)
9C	Low elevation (north slope) cool moisture

Enumerated Domain for Attribute: STCODE  
SP004 FSDB Database Study Code

Enumerated Domain for Attribute: SITE

- 10C Mid-elevation (south slope)
- 11C Riparian area
- 1C 1v control + high hot dry mc
- 1V High hot dry microclimate (mc)
- 2C North facing
- 2V North facing clear cut (mid-elevation)
- 2VC Control for 2v and 3v
- 3C Valley site near stream (no slope)
- 3V 15 year old doug-fir stand
- 4C Cool-wet high elevation (north slope) control for 6v.
- 4V 35 year old doug-fir stand
- 4VC Control for 4v
- 5C Site similar to 3c but higher
- 5V Big-leaf maple site
- 5VC Control for 5v
- 6C High-moisture site (north facing)
- 6V Sitka alder veg. site
- 7C Moisture mid-elevation (north facing veg. site)
- 8C High dry hot site (south facing ridge top)
- 9C Low elevation (north slope) cool moisture

Enumerated Domain for Attribute: STCODE  
SP004 FSDB Database Study Code

Enumerated Domain for Attribute: TREATMNT

- N Total respiration from soil and litter: no treatment
- P Respiration from litter only

Enumerated Domain for Attribute: SITE

- 10C Mid-elevation (south slope)
- 11C Riparian area
- 1C 1v control + high hot dry mc
- 1V High hot dry microclimate (mc)
- 2C North facing

2V	North facing clear cut (mid-elevation)
2VC	Control for 2v and 3v
3C	Valley site near stream (no slope)
3V	15 year old doug-fir stand
4C	Cool-wet high elevation (north slope) control for 6v.
4V	35 year old doug-fir stand
4VC	Control for 4v
5C	Site similar to 3c but higher
5V	Big-leaf maple site
5VC	Control for 5v
6C	High-moisture site (north facing)
6V	Sitka alder veg. site
7C	Moisture mid-elevation (north facing veg. site)
8C	High dry hot site (south facing ridge top)
9C	Low elevation (north slope) cool moisture

Enumerated Domain for Attribute: STCODE  
 SP004 FSDB Database Study Code

Enumerated Domain for Attribute: ASPECT

High flat	High flat
North	North
North-flat	North-flat
South	South
South-flat	South-flat

Enumerated Domain for Attribute: SITE

10C	Mid-elevation (south slope)
11C	Riparian area
1C	1v control + high hot dry mc
1V	High hot dry microclimate (mc)
2C	North facing
2V	North facing clear cut (mid-elevation)
2VC	Control for 2v and 3v
3C	Valley site near stream (no slope)
3V	15 year old doug-fir stand
4C	Cool-wet high elevation (north slope) control for 6v.

4V	35 year old doug-fir stand
4VC	Control for 4v
5C	Site similar to 3c but higher
5V	Big-leaf maple site
5VC	Control for 5v
6C	High-moisture site (north facing)
6V	Sitka alder veg. site
7C	Moisture mid-elevation (north facing veg. site)
8C	High dry hot site (south facing ridge top)
9C	Low elevation (north slope) cool moisture

Enumerated Domain for Attribute: STANDAGE

YS	young stand
MS	mature stand
OG	old growth
CC	Clearcut

Enumerated Domain for Attribute: STCODE

SP004	FSDB Database Study Code
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Enumerated Domain for Attribute: VEG

BL maple	Broad-leaf maple
Clearcut	Clearcut
Douglas-fir	Douglas-fir
Noble fir	Noble fir
Sitka alder	Sitka alder