SEVI Site: BigFoot Field Data Documentation and Photos

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The Universal Transverse Mercator (UTM) coordinate system is a grid-based method of specifying locations on the surface of the Earth. It is used to identify locations on the earth, but differs from the traditional method of latitude and longitude in several respects. The UTM system is not a single map projection. The system instead employs a series of sixty zones, each of which is based on a specifically defined Transverse Mercator projection.
The easting is the projected distance in meters of the position from the central meridian, while the northing is the projected distance in meters of the point from the equator.

SEVI Plot Pictures README File

A set of five pictures was taken of each SEVI plot on the following days:

- March 10-12, 2002
- May 21-29, 2002
- August 21, 2002
- September 9-16, 2002
- November 15-21, 2002

In each set of images:

- first picture is of the plot center stake
- second facing north from plot center
- third facing east from plot center
- fourth facing south from plot center
- fifth facing west from plot center

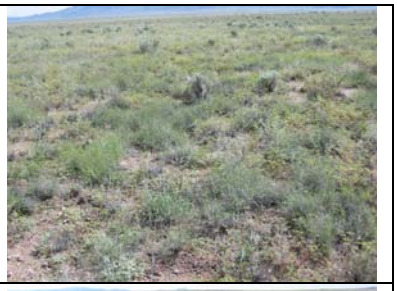
Subplots are numbered 1, 2, 3, 4, and 5 referring to center, north, east, south, and west, respectively

The image file name syntax follows this template: PLOT_SUBPLOT.jpg

For example, 00_1.jpg is plot 0, subplot 1

Selected Plot Pictures: September 9-16, 2002

SEVI Plot 7	Images
Subplot 1	
Subplot 2	

Subplot 3	
Subplot 4	
Subplot 5	

2002 SEVI TISSUE NITROGEN README DOCUMENT (sevi_nitrogen_analysis_readme.txt)

TISSUE NITROGEN CONCENTRATION DATA FOR SELECTED PLANTS**********

General Comments:
* Tissues were dried to a constant mass at 70 C and ground.
* Samples were analyzed using the Kjeldahl digestion technique at the UW Soil and Plant Analysis Lab, Madison, WI.
* Values are reported in total percent nitrogen.

2002 SEVI ANPP, BIOMASS, LAI README DOCUMENT
(sevi_2002_anpp_biomass_lai_readme.txt)

BIGFOOT PROJECT - SEVI site (Soccorro, NM) Sevilleta LTER - Year 2002********

*****BIOMASS*****

-all mass values are in kg/ha and reported as total dry mass, not carbon

Sampling Dates:

-May (21-29)
- -all plots sampled
- -no live biomass
  - -will not be computed....biomass=0

-July (26-29)
- -all plots sampled
- -started greening up...still not much green material though
- -blue grama was all leaf mass at this sampling period, little to no stem
  - -separated into alive and dead
    - -alive is all leaf
    - -dead is old stem from previous years
- -black grama has very small amount of green present
  - -separated into new leaf, new stem, old stem, and dead
    - -new stem was produced in current year
      - -greener, lighter in weight
    - -old stem has over-wintered and is still alive, but is not new growth
    - -new leaf produced in current year
- -monsoon season should be starting soon.....never came until ~mid sept/oct

-August (22-28)
- -2nd order plots sampled by BigFoot technician
- -more green biomass present, still lacking in precipitation
- -blue grama now has considerable amount of stem present
  - -sorted into new leaf, new stem, and dead
- -black grama has more green present
  - -sorted into new leaf, new stem, old stem, and dead

-September (9-16)
- -max biomass sampling date
- -all plots sampled
- -blue grama sorted same as august
- -black grama sorted same as august

-November (15-21)
- -all plots sampled
- -all plant material was cured out

-all grass was seeded (headed) out
-black grama separated into same components as previous sampling dates
-blue grama separated same as previous dates

*****ALLOMETRY*****

-a separate readme file can be found in this directory explaining each allometric equation, derivation, and explanation of error

*****LEAF AREA INDEX*****

-all leaf area index values are unitless or m^2/m^2

Direct Leaf Area estimates
-estimates used site, species, and date specific sla values computed in this program
-predicted from % cover at each subplot, then averaged for plot
-measurements made at same time as % cover measurements
-lai reported is actually plant area index of green material (photosynthetically active)

Indirect Leaf Area estimates
-optically measured w/ LICOR LAI 2000's
-used half caps
-approx. half of the measurements were taken during dusk/dawn, other half during overcast conditions
-LAI 2000 would measure all standing vegetation, ie. all the dead standing material in the black grama
-I would hazard against using these numbers because of this reason
-I don't believe it's possible to separate out the dead standing contribution to the lai2000 measurement
-optical measurements made at the same time as % cover measurements which predict biomass

*****OTHER NOTES*****
-missing values are represented by a blank cell
-in the case of oldstem, there was no old stem for blue grama, only new stem (after july) and new leaf
-no direct stem lai for blue grama in july, all mass and leaf area was leaf
-there is no 'old stem' component for blue grama only new stem and new leaf
-some optical lai measurements were not used due to equipment failures
-percent shrub cover estimates are NOT creosote bush estimates
-'shrub' was defined as any plant with a woody stem
-plots with creosote bush and number of bushes are:
-92 (n=1)
-93 (n=3)
-95 (n=2)

*****VARIABLE EXPLANATIONS*****

site = bigfoot site id (sevi = Sevilleta National Wildlife Refuge, LTER site)
year = year data was collected
month = month data was collected
date = day of month data was collected
plot = bigfoot plot id (0-99)
cover_classification = classification based on visual confirmation, cover types include: blue grama burned, blue grama unburned, black grama burned, and black grama unburned
FREQ = number of subplots averaged for mass variables
percentgrass = fraction of plot covered by grass, based on 5 separate % cover estimates with a 1m x 1m grid taken each sampling period
percentshrub = fraction of plot covered by anything other than grass, based on 5 separate % cover estimates with a 1m x 1m grid taken each sampling period
newstem = mass of new stem (produced in current growing season), predicted with allometric equations
newleaf = mass of new leaves (produced in current growing season), predicted with allometric equations
oldstem = mass of old stem (stem is still alive, but not produced in current growing season), predicted with allometric equations
anpp = aboveground net primary production, includes new stem and new leaf
biomass = total aboveground living biomass; black grama = new stem + new leaf + old stem.
blue grama = new stem + new leaf (there was no old stem for blue grama)
pergrass_se = standard error of percentgrass
pershrub_se = standard error of percentshrub
newstem_se = standard error of newstem
newleaf_se = standard error of newleaf
oldstem_se = standard error of oldstem
anpp_se = standard error of anpp
biomass_se = standard error of biomass
directstemlai = direct estimate of stem lai (or stem area index, sai), this includes new stem and old stem, although they may not both have same photosynthetic capacity or chlorophyll content
directleaflai = direct estimate of leaf lai (an actual leaf area index value)
stemlai_se = standard error of directstemlai
leaflai_se = standard error of directleaflai
optical_fpar = fapar (fraction of absorbed photosythetic active radiation) calculated using the 'difn' output from the LAI 2000
optical_lai = optical lai measurement taken w/ LI-COR LAI 2000
optical_fpar_se = standard error of opticalfpar
optical_lai_se = standard error of opticallai

created by: Al Kirschbaum (UW-Madison, aakirsch@wisc.edu)
date created: 03/03/03

modified:
modifications made:

2002 SEVI SOIL RESPIRATION README DOCUMENT
(sevi_soil_resp_avg_plot_LD_readme.txt)

BIGFOOT PROJECT - SEVI site (Soccorro, NM) Sevilleta LTER**********

Respiration Data:

- -measurements taken w/ LICOR 6250 CO2 analyzer
- -chamber size = 10759 cc
- -light and dark measurements were taken at each collar
- -five collars per plot
- -vegetation was not clipped prior to measurements

Variable Definitions:

site = BigFoot site id
year = year data was collected
month = month data was collected
date = day of month data was collected
plot = plot id, all plots measured for soil respiration were 1st order plots
light_dark = light (L) measurements taken with no cover over chamber, dark (D) measurements were taken with black cloth covering entire chamber
PHOTO = photosynthesis (micromol C/m2/sec)
gCm2sec = grams of carbon per meter squared per second
gCm2yr = grams of carbon per meter squared per year
T2 = soil temperature (C) at 2 cm
T10 = soil temperature (C) at 10 cm
photo_se = standard error of PHOTO
gCm2sec_se = standard error of gCm2sec
gCm2yr_se = standard error of gCm2yr

Created by: Al Kirschbaum (UW-Madison, aakirsch@wisc.edu)

Created on: 1/22/03

Last modified: 1/22/03

Changes made:

2003 SEVI SOIL RESPIRATION README DOCUMENT
(sevi_2003_soil_respiration_read_me.doc)

****** BIGFOOT PROJECT - SEVI site (Soccorro, NM) Sevilleta LTER******

Respiration measurements in 2003 were conducted in the same fashion as 2002, and were done at the same collars/plots.

Respiration Data:

-measurements taken w/ LICOR 6250 CO2 analyzer
-chamber size = 10759 cc
-light and dark measurements were taken at each collar
-five collars per plot
-vegetation was not clipped prior to measurements

Variable Definitions:

site = BigFoot site id
year = year data was collected
month = month data was collected
date = day of month data was collected
plot = plot id, all plots measured for soil respiration were 1st order plots
light_dark = light (L) measurements taken with no cover over chamber, dark (D) measurements were taken with black cloth covering entire chamber
PHOTO = photosynthesis (micromol C/m2/sec)
gCm2sec = grams of carbon per meter squared per second
gCm2yr = grams of carbon per meter squared per year
T2 = soil temperature (C) at 2 cm
T10 = soil temperature (C) at 10 cm
photo_se = standard error of PHOTO
gCm2sec_se = standard error of gCm2sec
gCm2yr_se = standard error of gCm2yr

Created by: Al Kirschbaum (UW-Madison, aakirsch@wisc.edu)

Created on: 1/22/03

Last modified: 5/7/04 by Jenny Carney

2002 SEVI ALLOMETRY README DOCUMENT (sevi_2002_allometry_readme.doc)

2002 Allometry Data for SEVI (Soccorro, NM) Sevilleta LTER

Created: 2/5/2003
Created by: Al Kirschbaum (UW-Madison, aakirsch@wisc.edu)

Last modified:
Modifications made:

Notes:

-all allometric equations were developed using S+ statistical software and the 'boxcox' best fit function

-separate equations were developed for each grass component relating percent cover to biomass

-data organized by sample month and grass type, starting with July, ending in November

-no allometric equations were developed for Blue Grama Burned or Unburned for July sampling date

-all mass from plants was leaf mass

-allometric equations have not been developed for September

-samples are still being processed as of 2/5/03

-these equations will be added after samples have been processed

-allometric equations were calculated for each sampling date and for each of the following components:

-blue grama burned leaf (new)
-blue grama burned stem (new)
-blue grama unburned leaf (new)
-blue grama unburned stem (new)
-black grama unburned leaf (new)
-black grama unburned stem (new)
-black grama unburned stem (old)

-these equations were based on allometry samples taken at the end of each trip in each of major cover types

-the same % cover grid used at each plot, was placed on a range of % cover, from low to high, recorded, clipped and placed into a grocery bag for sorting

-samples were sorted into the same components predicted with the allometric equations
-% cover grid was 1 meter by 1 meter
-~10-15 samples were taken in each cover type and sampling period

-allometric equations were in the form of:

log (y) ~ int + B1 * x
solved: y = exp (int + B1 * x)
sqrt (y) ~ int + B1 * x
solved: y = (int + B1 * x)**2
linear (y) = int + B1 * x
solved: y = int + B1 * x
*note: (x is independent variable, y is dependent)

Questions? Please contact Al Kirschbaum at aakirsch@wisc.edu

Month = July
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.6355 -0.2138 0.005833 0.192 0.6463

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.1013 0.2070 5.3212 0.0001
PercentCover 2.8385 0.4031 7.0409 0.0000

Residual standard error: 0.3858 on 13 degrees of freedom
Multiple R-Squared: 0.7922
F-statistic: 49.57 on 1 and 13 degrees of freedom, the p-value is 8.788e-006

Month = July
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(NewStem) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-1.223 -0.4079 -0.04881 0.4047 1.26

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) -1.5189 0.3917 -3.8775 0.0019
PercentCover 3.0078 0.7630 3.9419 0.0017

Residual standard error: 0.7301 on 13 degrees of freedom
Multiple R-Squared: 0.5445
F-statistic: 15.54 on 1 and 13 degrees of freedom, the p-value is 0.001687

Month = July
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(OldStem) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-1.425 -0.734 -0.2189 0.293 2.449

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.9021 0.5924 3.2110 0.0068
PercentCover 5.6131 1.1539 4.8645 0.0003

Residual standard error: 1.104 on 13 degrees of freedom
Multiple R-Squared: 0.6454
F-statistic: 23.66 on 1 and 13 degrees of freedom, the p-value is 0.000309

Month = July
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.9794 -0.5604 0.02053 0.4379 1.103

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.8724 0.4455 4.2031 0.0023
PercentCover 6.6977 1.7960 3.7293 0.0047

Residual standard error: 0.6965 on 9 degrees of freedom
Multiple R-Squared: 0.6071
F-statistic: 13.91 on 1 and 9 degrees of freedom, the p-value is 0.004703

Month = July
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.663 -0.4486 -0.2107 0.217 1.462

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) -0.2835 0.4243 -0.6681 0.5229
PercentCover 11.6751 1.7079 6.8359 0.0001

Residual standard error: 0.6951 on 8 degrees of freedom
Multiple R-Squared: 0.8538
F-statistic: 46.73 on 1 and 8 degrees of freedom, the p-value is 0.0001329

Month = August
Grass Type = Black Grama
Burn Type = Burned and Unburned

Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = New.Leaf ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
```
   Min     1Q  Median    3Q   Max
-5.536 -3.107 -0.5961 2.643 6.801
```

Coefficients:
```
             Value Std. Error t value Pr(>|t|)
 (Intercept)  4.2632  2.1126     2.0180  0.0647
PercentCover 25.0119  4.4186     5.6605  0.0001
```

Residual standard error: 4.075 on 13 degrees of freedom
Multiple R-Squared: 0.7114
F-statistic: 32.04 on 1 and 13 degrees of freedom, the p-value is 0.00007791

Month = August
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = New.Stem ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
```
   Min     1Q Median    3Q   Max
-10.8 -5.287 0.2118 5.697 11.83
```

Coefficients:
```
             Value Std. Error t value Pr(>|t|)
 (Intercept)  8.5937  4.1938     2.0492  0.0612
PercentCover 38.5841  8.7717     4.3987  0.0007
```

Residual standard error: 8.09 on 13 degrees of freedom
Multiple R-Squared: 0.5981
F-statistic: 19.35 on 1 and 13 degrees of freedom, the p-value is 0.0007194

Month = August
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(Old.Stem) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
```
   Min      1Q Median     3Q   Max
-1.252 -0.5732 -0.213 0.4706 1.896
```

Coefficients:
```
             Value Std. Error t value Pr(>|t|)
```

(Intercept) 3.3280 0.4329 7.6873 0.0000
PercentCover 4.1377 0.9055 4.5694 0.0005

Residual standard error: 0.8351 on 13 degrees of freedom
Multiple R-Squared: 0.6163
F-statistic: 20.88 on 1 and 13 degrees of freedom, the p-value is 0.0005262

Month = August
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(NewLeaf) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.3203 -0.1943 -0.03254 0.131 0.4512

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 2.4471 0.1614 15.1648 0.0000
PercentCover 2.7207 0.6537 4.1621 0.0032

Residual standard error: 0.2597 on 8 degrees of freedom
Multiple R-Squared: 0.6841
F-statistic: 17.32 on 1 and 8 degrees of freedom, the p-value is 0.003156

Month = August
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(NewStem) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.841 -0.3902 0.1419 0.2929 0.8853

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.5801 0.3500 4.5143 0.0020
PercentCover 4.1165 1.4179 2.9031 0.0198

Residual standard error: 0.5633 on 8 degrees of freedom
Multiple R-Squared: 0.513
F-statistic: 8.428 on 1 and 8 degrees of freedom, the p-value is 0.0198

Month = August
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = NewLeaf ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
   Min   1Q Median   3Q   Max
-4.531 -2.553 -0.1659 2.948 5.095

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 1.8380 2.7468   0.6691 0.5222
PercentCover 53.3726 10.4909   5.0875 0.0009

Residual standard error: 3.657 on 8 degrees of freedom
Multiple R-Squared: 0.7639
F-statistic: 25.88 on 1 and 8 degrees of freedom, the p-value is 0.0009443

Month = August
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = sqrt(NewStem) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
   Min   1Q   Median   3Q   Max
-0.61 -0.2951 -0.02477 0.1388 0.7903

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 0.7357 0.3379   2.1776 0.0611
PercentCover 5.9135 1.2904   4.5827 0.0018

Residual standard error: 0.4498 on 8 degrees of freedom
Multiple R-Squared: 0.7242
F-statistic: 21 on 1 and 8 degrees of freedom, the p-value is 0.001796

Month = September
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = NewLeaf ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
   Min   1Q Median   3Q   Max
-9.47 -2.269 0.03491 2.125 8.214

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 5.2356 2.4238   2.1601 0.0500
PercentCover 22.4168 4.2909   5.2243 0.0002

Residual standard error: 4.433 on 13 degrees of freedom

Multiple R-Squared: 0.6774
F-statistic: 27.29 on 1 and 13 degrees of freedom, the p-value is 0.000164

Month = September
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = NewStem ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-20.89 -5.003 0.5417 4.435 17.19

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 11.7343 5.1188 2.2924 0.0392
PercentCover 38.4596 9.0619 4.2441 0.0010

Residual standard error: 9.362 on 13 degrees of freedom
Multiple R-Squared: 0.5808
F-statistic: 18.01 on 1 and 13 degrees of freedom, the p-value is 0.0009576

Month = September
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(OldStem) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-1.963 -0.5803 -0.1037 0.8785 1.892

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 2.8052 0.6654 4.2157 0.0010
PercentCover 5.6280 1.1780 4.7775 0.0004

Residual standard error: 1.217 on 13 degrees of freedom
Multiple R-Squared: 0.6371
F-statistic: 22.82 on 1 and 13 degrees of freedom, the p-value is 0.0003612

Month = September
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.618 -0.3531 -0.2198 0.2969 0.9066

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.6098 0.3256 4.9441 0.0004
PercentCover 12.4472 1.3225 9.4122 0.0000

Residual standard error: 0.5388 on 11 degrees of freedom
Multiple R-Squared: 0.8895
F-statistic: 88.59 on 1 and 11 degrees of freedom, the p-value is 1.35e-006

Month = September
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(NewStem) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.6171 -0.1547 0.007204 0.2409 0.5266

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.8921 0.1971 9.6012 0.0000
PercentCover 4.1302 0.8004 5.1604 0.0003

Residual standard error: 0.3261 on 11 degrees of freedom
Multiple R-Squared: 0.7077
F-statistic: 26.63 on 1 and 11 degrees of freedom, the p-value is 0.0003131

Month = September
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
Min 1Q Median 3Q Max
-0.9051 -0.274 0.0671 0.3768 0.4989

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 2.0637 0.3314 6.2278 0.0003
PercentCover 8.5803 1.3328 6.4380 0.0002

Residual standard error: 0.4729 on 8 degrees of freedom
Multiple R-Squared: 0.8382
F-statistic: 41.45 on 1 and 8 degrees of freedom, the p-value is 0.0002009

Month = September
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = sqrt(NewStem) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
    Min   1Q Median   3Q   Max
 -0.5771 -0.4123 -0.233 0.3912 1.037

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 1.9229 0.4078   4.7153 0.0015
PercentCover 6.7740 1.6402   4.1301 0.0033

Residual standard error: 0.5819 on 8 degrees of freedom
Multiple R-Squared: 0.6807
F-statistic: 17.06 on 1 and 8 degrees of freedom, the p-value is 0.003298

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(NewLeaf) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
    Min   1Q   Median   3Q   Max
 -0.6587 -0.1876 -0.03055 0.2832 0.4626

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 1.6421 0.1877   8.7486 0.0000
PercentCover 1.7282 0.3642   4.7453 0.0004

Residual standard error: 0.3325 on 13 degrees of freedom
Multiple R-Squared: 0.634
F-statistic: 22.52 on 1 and 13 degrees of freedom, the p-value is 0.0003827

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = NewStem ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
    Min   1Q Median   3Q   Max
 -9.867 -5.912 -1.057 6.532 11.79

Coefficients:
            Value Std. Error t value Pr(>|t|)
 (Intercept) 5.6562 4.2914   1.3180 0.2102
PercentCover 62.2163 8.3265   7.4721 0.0000

Residual standard error: 7.601 on 13 degrees of freedom
Multiple R-Squared: 0.8111
F-statistic: 55.83 on 1 and 13 degrees of freedom, the p-value is 4.683e-006

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = log(OldStem) ~ PercentCover, data = Black, na.action = na.exclude)

Residuals:
```
    Min      1Q  Median     3Q    Max
-0.3248 -0.1826 0.01051 0.1279 0.6774
```

Coefficients:
```
             Value Std. Error t value Pr(>|t|)
 (Intercept)  1.7245  0.1469    11.7364  0.0000
PercentCover  2.5624  0.2851     8.9878  0.0000
```

Residual standard error: 0.2603 on 13 degrees of freedom
Multiple R-Squared: 0.8614
F-statistic: 80.78 on 1 and 13 degrees of freedom, the p-value is 6.115e-007

Month = November
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewLeaf) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
```
    Min      1Q   Median     3Q   Max
-1.755 -0.5264 -0.08723 0.391 1.932
```

Coefficients:
```
             Value Std. Error t value Pr(>|t|)
 (Intercept) 2.7759 0.5615     4.9436  0.0003
PercentCover 6.7977 1.8206     3.7337  0.0025
```

Residual standard error: 1.117 on 13 degrees of freedom
Multiple R-Squared: 0.5175
F-statistic: 13.94 on 1 and 13 degrees of freedom, the p-value is 0.002504

Month = November
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = sqrt(LiveStem) ~ PercentCover, data = BlueBurned, na.action = na.exclude)

Residuals:
   Min   1Q Median   3Q   Max
-1.361 -0.7938 -0.1894 0.5298 2.321

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 2.4396 0.5655   4.3137 0.0008
PercentCover 10.1052 1.8337   5.5108 0.0001

Residual standard error: 1.125 on 13 degrees of freedom
Multiple R-Squared: 0.7002
F-statistic: 30.37 on 1 and 13 degrees of freedom, the p-value is 0.0001003

Month = November
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(LiveLeaf) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
    Min   1Q   Median   3Q   Max
-0.8968 -0.3071 -0.01757 0.246 1.229

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 2.6679 0.2792   9.5542 0.0000
PercentCover 5.1527 0.8130   6.3378 0.0000

Residual standard error: 0.5711 on 13 degrees of freedom
Multiple R-Squared: 0.7555
F-statistic: 40.17 on 1 and 13 degrees of freedom, the p-value is 0.00002585

Month = November
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(LiveStem) ~ PercentCover, data = BlueUnburned, na.action = na.exclude)

Residuals:
    Min   1Q   Median   3Q   Max
-0.8793 -0.2868 -0.03054 0.3503 0.6085

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 2.0531 0.2358   8.7083 0.0000
PercentCover 2.8279 0.6864   4.1196 0.0012

Residual standard error: 0.4822 on 13 degrees of freedom
Multiple R-Squared: 0.5662
F-statistic: 16.97 on 1 and 13 degrees of freedom, the p-value is 0.001208

2003 SEVI ALLOMETRY README DOCUMENT (sevi_2003_allometry_readme.doc)

2003 Allometry Data for SEVI (Soccorro, NM) Sevilleta LTER

Created: 5/3/2004
Created by: Jenny Carney (UW-Madison, jecarney@wisc.edu)

Last modified:
Modifications made:

Notes:

-all allometric equations were developed using S+ statistical software and the 'boxcox' best fit function

-separate equations were developed for each grass component relating percent cover to biomass

-data organized by sample month and grass type, starting with June, ending in November

-allometric equations were calculated for each sampling date and for each of the following components:
- -blue grama burned leaf (new)
- -blue grama burned stem (new)
- -blue grama unburned leaf (new)
- -blue grama unburned stem (new)
- -black grama unburned leaf (new)
- -black grama unburned stem (new)
- -black grama unburned stem (old)
- -burn 03 (blue grama) leaf (new)

-new stem equations were only developed for the month of November because not enough growth occurred prior to then for the grasses to have differentiated stems and leaves

-'burn 03' is a new cover classification this year referring to the plots that were burned in June of 2003. Vegetation did not start growing until November, so that is the only month when 'burn 03' allometry was done. Also, only new leaf was estimated because of the lack of differentiation between stem and leaves due to minimal growth.

-these equations were based on allometry samples taken at the end of each trip in each of major cover types
- -the same % cover grid used at each plot, was placed on a range of % cover, from low to high, recorded, clipped and placed into a grocery bag for sorting
  - -samples were sorted into the same components predicted with the allometric equations
  - -% cover grid was 1 meter by 1 meter
  - -~10-15 samples were taken in each cover type and sampling period

-allometric equations were in the form of:
- log (y) ~ int + B1 * x
  - solved: y = exp (int + B1 * x)
- sqrt (y) ~ int + B1 * x
  - solved: y = (int + B1 * x)**2
- linear (y) = int + B1 * x
  - solved: y = int + B1 * x
- *note: (x is independent variable, y is dependent)

Questions? Please contact Jenny Carney at jecarney@wisc.edu

Month = June
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(NewMass) ~ PercentCover, data = BlackJune03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.6437 -0.2175 -0.02191 0.2662 0.5625

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.4878 0.1559 9.5422 0.0000
PercentCover 2.0439 0.4532 4.5101 0.0006

Residual standard error: 0.3628 on 13 degrees of freedom
Multiple R-Squared: 0.6101
F-statistic: 20.34 on 1 and 13 degrees of freedom, the p-value is 0.0005864

Month = June
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(OldStem) ~ PercentCover, data = BlackJune03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-1.23 -0.4811 -0.2036 0.5377 1.428

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 3.0179 0.3585 8.4184 0.0000
PercentCover 6.6053 1.0420 6.3389 0.0000

Residual standard error: 0.8343 on 13 degrees of freedom
Multiple R-Squared: 0.7556
F-statistic: 40.18 on 1 and 13 degrees of freedom, the p-value is 0.0000258

Month = June
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(newmass) ~ percentcover, data = BlueBurnJune03.df, na.action = na.exclude)
Residuals:

```
    Min      1Q  Median      3Q     Max
-0.3942 -0.2309 0.02809 0.1938 0.5642

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 1.3965 0.2256     6.1893  0.0003
percentcover 5.8949 1.3117     4.4940  0.0020

Residual standard error: 0.3251 on 8 degrees of freedom
Multiple R-Squared: 0.7163
F-statistic: 20.2 on 1 and 8 degrees of freedom, the p-value is 0.002018
```

Month = June
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

```
          *** Linear Model ***

Call: lm(formula = sqrt(newmass) ~ cover, data = SDF7.df, na.action = na.exclude)
Residuals:
    Min      1Q Median     3Q    Max
-0.5923 -0.3305    0.1 0.3146 0.392

Coefficients:
            Value Std. Error t value Pr(>|t|)
(Intercept) 0.5976 0.2340     2.5538  0.0253
      cover 8.9259 1.3481     6.6209  0.0000

Residual standard error: 0.3815 on 12 degrees of freedom
Multiple R-Squared: 0.7851
F-statistic: 43.84 on 1 and 12 degrees of freedom, the p-value is 0.00002462
```

Month = July
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

```
          *** Linear Model ***

Call: lm(formula = sqrt(newmass) ~ logpc, data = blackjuly03.df, na.action = na.exclude)
Residuals:
    Min      1Q  Median     3Q    Max
-0.6516 -0.2972 0.07951 0.2147 0.7319

Coefficients:
             Value Std. Error t value Pr(>|t|)
(Intercept)  2.8422  0.2013    14.1223  0.0000
      logpc  0.9724  0.1887     5.1522  0.0002

Residual standard error: 0.4269 on 13 degrees of freedom
Multiple R-Squared: 0.6713
F-statistic: 26.55 on 1 and 13 degrees of freedom, the p-value is 0.0001859
```

Month = July
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(oldstem) ~ percentcover, data = blackjuly03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-1.403 -0.9875 0.1987 0.9438 1.69

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.3240 0.4236 3.1260 0.0080
percentcover 11.4616 1.2618 9.0837 0.0000

Residual standard error: 1.1 on 13 degrees of freedom
Multiple R-Squared: 0.8639
F-statistic: 82.51 on 1 and 13 degrees of freedom, the p-value is 5.422e-007

Month = July
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = newmass ~ percentcover, data = BlueBurnJuly03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-3.819 -2.127 0.1486 2.023 2.858

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 2.6543 1.1825 2.2446 0.0463
percentcover 26.8697 6.5587 4.0968 0.0018

Residual standard error: 2.441 on 11 degrees of freedom
Multiple R-Squared: 0.6041
F-statistic: 16.78 on 1 and 11 degrees of freedom, the p-value is 0.001769

Month = July
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = NewMass ~ PercentCover, data = BlackJune03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-4.75 -1.567 0.3954 1.569 2.593

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.8725 0.8668 2.1603 0.0500
PercentCover 28.0585 6.3687 4.4057 0.0007

Residual standard error: 2.098 on 13 degrees of freedom
Multiple R-Squared: 0.5989
F-statistic: 19.41 on 1 and 13 degrees of freedom, the p-value is 0.0007102

Month = September
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(newmass) ~ percentcover, data = blacksep03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.7888 -0.199 -0.01494 0.2246 0.7461

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.0997 0.2534 4.3394 0.0015
percentcover 2.6226 0.6431 4.0778 0.0022

Residual standard error: 0.4682 on 10 degrees of freedom
Multiple R-Squared: 0.6245
F-statistic: 16.63 on 1 and 10 degrees of freedom, the p-value is 0.002222

Month = September
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = oldstem ~ percentcover, data = blacksep03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-11.83 -5.356 -0.1916 5.142 13.26

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 2.2587 4.6603 0.4847 0.6384
percentcover 80.5286 11.8268 6.8090 0.0000

Residual standard error: 8.61 on 10 degrees of freedom
Multiple R-Squared: 0.8226
F-statistic: 46.36 on 1 and 10 degrees of freedom, the p-value is 0.00004689

Month = September
Grass Type = Blue Grama

Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(newmass) ~ cover, data = blueburnsep03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.5902 -0.154 -0.01465 0.2348 0.4362

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.3010 0.2049 6.3501 0.0001
cover 6.2168 1.2271 5.0664 0.0007

Residual standard error: 0.3571 on 9 degrees of freedom
Multiple R-Squared: 0.7404
F-statistic: 25.67 on 1 and 9 degrees of freedom, the p-value is 0.0006752

Month = September
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(newmass) ~ percentcover, data = blueunsep03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.88 -0.3142 0.1287 0.2272 0.617

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 0.0560 0.2198 0.2549 0.8035
percentcover 5.4462 1.3403 4.0633 0.0019

Residual standard error: 0.4526 on 11 degrees of freedom
Multiple R-Squared: 0.6002
F-statistic: 16.51 on 1 and 11 degrees of freedom, the p-value is 0.001873

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = log(newleaf) ~ percentcover, data = blacknov03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.5203 -0.2441 0.001746 0.2844 0.373

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 0.8756 0.1655 5.2918 0.0002

percentcover 1.6774 0.3563 4.7074 0.0005

Residual standard error: 0.3051 on 12 degrees of freedom
Multiple R-Squared: 0.6487
F-statistic: 22.16 on 1 and 12 degrees of freedom, the p-value is 0.0005078

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = sqrt(newstem) ~ percentcover, data = blacknov03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.6455 -0.3671 -0.07216 0.2429 1.179

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 1.1927 0.2801 4.2586 0.0011
percentcover 4.1090 0.6031 6.8126 0.0000

Residual standard error: 0.5165 on 12 degrees of freedom
Multiple R-Squared: 0.7946
F-statistic: 46.41 on 1 and 12 degrees of freedom, the p-value is 0.00001869

Month = November
Grass Type = Black Grama
Burn Type = Burned and Unburned
Grass Component = OldStem

*** Linear Model ***

Call: lm(formula = sqrt(oldstem) ~ percentcover, data = blacknov03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.9696 -0.2277 0.07897 0.2535 0.8558

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 3.3084 0.2824 11.7143 0.0000
percentcover 5.6541 0.6082 9.2961 0.0000

Residual standard error: 0.5209 on 12 degrees of freedom
Multiple R-Squared: 0.8781
F-statistic: 86.42 on 1 and 12 degrees of freedom, the p-value is 7.834e-007

Month = November
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = newleaf ~ percentcover, data = blueburnnov03.df, na.action = na.exclude)
Residuals:
   Min   1Q Median   3Q   Max
-6.786 -0.5682 0.8143 1.194 1.933

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 2.3717 0.9886   2.3992 0.0321
percentcover 72.3838 5.5518   13.0380 0.0000

Residual standard error: 2.259 on 13 degrees of freedom
Multiple R-Squared: 0.929
F-statistic: 170 on 1 and 13 degrees of freedom, the p-value is 7.679e-009

Month = November
Grass Type = Blue Grama
Burn Type = Burned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = sqrt(newstem) ~ percentcover, data = blueburnnov03.df, na.action = na.exclude)
Residuals:
    Min   1Q Median   3Q   Max
-0.8069 -0.3115 -0.1279 0.3979 0.9031

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 0.8910 0.2221   4.0111 0.0015
percentcover 6.6391 1.2475   5.3221 0.0001

Residual standard error: 0.5077 on 13 degrees of freedom
Multiple R-Squared: 0.6854
F-statistic: 28.32 on 1 and 13 degrees of freedom, the p-value is 0.0001385

Month = November
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewLeaf

*** Linear Model ***

Call: lm(formula = sqrt(newleaf) ~ percentcover, data = blueunburnednov03.df, na.action = na.exclude)
Residuals:
    Min   1Q   Median   3Q   Max
-0.4685 -0.2547 -0.04858 0.1636 0.8001

Coefficients:
             Value Std. Error t value Pr(>|t|)
 (Intercept) 1.7374 0.1744   9.9601 0.0000
percentcover 8.2153 0.8447   9.7252 0.0000

Residual standard error: 0.3475 on 13 degrees of freedom
Multiple R-Squared: 0.8792
F-statistic: 94.58 on 1 and 13 degrees of freedom, the p-value is 2.484e-007

Month = November
Grass Type = Blue Grama
Burn Type = Unburned
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(newstem) ~ percentcover, data = blueunburnednov03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.6823 -0.3277 0.06531 0.2489 0.7281

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) -0.5654 0.2167 -2.6087 0.0216
percentcover 6.1575 1.0496 5.8664 0.0001

Residual standard error: 0.4318 on 13 degrees of freedom
Multiple R-Squared: 0.7258
F-statistic: 34.42 on 1 and 13 degrees of freedom, the p-value is 0.00005533

Month = November
Grass Type = Blue Grama
Burn Type = Burn 03
Grass Component = NewStem

*** Linear Model ***

Call: lm(formula = log(newmass) ~ percentcover, data = burn03nov03.df, na.action = na.exclude)
Residuals:
Min 1Q Median 3Q Max
-0.2729 -0.07133 0.02101 0.1434 0.2015

Coefficients:
Value Std. Error t value Pr(>|t|)
(Intercept) 0.8726 0.1358 6.4259 0.0004
percentcover 9.8145 1.2263 8.0034 0.0001

Residual standard error: 0.1695 on 7 degrees of freedom
Multiple R-Squared: 0.9015
F-statistic: 64.06 on 1 and 7 degrees of freedom, the p-value is 0.0000909