

NOBS Site: BigFoot Field Data Documentation

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NOBS README DOCUMENT -- General

REFERENCES:

Appropriate references include:

Gower, S.T., J. Vogel, T.K. Stow, J.M. Norman, C.J. Kucharik and S.J. Steele. 1997. Carbon distribution and net primary production of aspen, jack pine and black spruce BOREAS forests. *J. Geophysical Research* 102 D24:29,029-29,041.

Gower, S.T., C.J. Kucharik and J.M. Norman. 1999. Direct and indirect estimation of leaf area index, fAPAR, and net primary production of terrestrial ecosystems. *Remote Sensing of Environment* 70:29-51.

NOTE 1 : THE LAI AND BIOMASS DATAFILES WERE UPDATED ON 5/14/01 (DCF). THE VALUES CHANGED SIGNIFICANTLY AFTER CAREFUL REVIEW OF THE DATA AND ANALYSES WERE PERFORMED.

THE FOLLOWING CHANGES WERE MADE TO THE DATA:

- Different allometric equations were used where needed for trees that were previously smaller than, or exceeded, the diameter range specified by the original (Boreas) allometric equations
- Missing subplots were filled in where possible using data collected in November of 2000 e.g. (Data was only collected at 2nd order plots in 2000, however.)
- Fixed typos etc., that were found after reviewing data for several thousand trees.

NOTE 2 : THE LAI DATAFILE WAS UPDATED ON 10/02/02 (AAK). UNDERSTORY LAI (1999 & 2000) AND MOSS LAI (1999 & 2000) WERE ADDED TO THE DATASET.

HOW LAI FOR UNDERSTORY AND MOSS WAS CALCULATED

1999 MOSS

- % Coverage was taken at 5 subplots at all plots (107)

-% coverage = lai...ie, if moss coverage was 0.97, moss lai was 0.97

2000 MoSS

- % coverage was taken at only 2nd order plots with 10 subplots

1999 UNDERSTORY

- 3rd order plot lai values were estimated using ratios of biomass:npp, leaf:stem, and an average sla

- 2nd order plot lai values were directly measured

2000 UNDERSTORY

- only 2nd order plots were clipped
 - specific leaf area was applied to these plots
 - only plots 80-100 were actually sorted into new and old
 - understory lai values for remaining plots are 1999's values
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I. LAI DATA

General Comments:

- * All data are reported as one-half total leaf surface area of the overstory.
- * No corrections for clumping are needed because data are based on allometric equations, not optical measurements.

II. BIOMASS DATA

General Comments:

- * Biomass data are reported as kg dry mass per hectare.
- * Basal area is reported in m² per hectare.
- * TPH = trees per hectare.

Specific Comments:

- * **FREQ** = number of subplots included in plot mean.
- * Plot 89 has been removed from the study because it was located outside the study area.

III. VEGETATION COVER DATA

Specific Comments:

- * Acronyms for vegetation cover types can be found on pages 2-3, 2-4, and 2-5 of the BigFoot Field Manual.
- * Plot 89 has been removed from the study because it was located outside the study area.

2000 NOBS FPAR README DOCUMENT

BIGFOOT PROJECT - NOBS site (Northern Old Black Spruce, Manitoba, CA)*****

(nobs_fpar_2000_README.txt)

- Data was collected during one sampling date (JULY)

- Fpar was calculated using the LAI 2000 variable "difn". This variable indicates the fraction of sky that is not blocked by foliage. This values ranges from 0 to 1. We converted this value to reflect the amount of radiation intercepted by the foliage.

- The instrument used, LAI 2000, only measures short wave (<490 nm) radiation.
0-79
- Variable name 'se' is the standard error of the mean.

- There are several plots and subplots missing fpar and lai data. This is due to limitations associated with the instrumentation used (LAI 2000). There are differences in the sensitivity associated with each of the units. The sensitivity is variable depending on the production year of the particular unit. Trials were conducted at the end of the growing season and it was concluded that, below a particular light level, the unit was less sensitive. Data associated with this lower light level is compromised and is not being used.

- Fpar data was only collected for the intensive (0-79 and 100-107) plots.

2000 NOBS ROOTS README DOCUMENT

BIGFOOT PROJECT - HARV site (HARVARD LTER) * ROOT BIOMASS/BNPP DATA

(NOBS File name: nobs_roots_2000_README.txt ??????)

- A 4.45 cm-diameter soil core was collected from 7 locations within each plot on 8/00 and 5 locations on 11/00

- Area sampled = 15.55 cm² per core, depth 50 cm

- The first 5 locations were the center and the 4 cardinal directions; the remaining two were from randomly assigned locations within the plot

- Samples were collected in August (max root growth) and November (min root growth)

- Below ground net primary production (BNPP) was calculated by subtracting min root growth from max root growth

- BNPP is in kg/ha

1999-2000 NOBS NPP README DOCUMENT

NOBS ANPP FOR YEARS 1999 & 2000 README FILE (nobs_npp_README.txt)

I. Tree NPP

- Wood Increment (WD_NPP) was estimated from increment cores collected in September, 2000 using site- and species-specific allometric equations relating biomass to tree diameter.

- Foliage Increment (FOL_NPP) was also estimated using increment cores and site- and species-specific allometric equations relating new foliage to tree diameter

- All values are reported in kg/ha dry mass

II. Understory NPP

1999

- Samples were collected in August of 1999 at all 1st & 2nd order plots
- A 0.25m² ring was placed at plot center and 9 m from plot center at north, east, south, and west, giving a total of 5 samples/plot

- Samples were immediately frozen, then separated into new and old growth, dried and weighed

- All values reported are in kg/ha dry mass

2000

- Samples were collected in July of 2000 at all 1st & 2nd order plots

- Ten samples, each 0.25m², were collected at each plot.

This was done to help minimize within plot variability.

- Approximately half of these samples were immediately dried to prevent rotting due to the rainy weather encountered while collecting samples.

These samples were therefore unable to be separated into new/old growth due to the need of fresh or frozen samples to determine new and old growth on understory species.

- The other half were immediately frozen, then separated into new and old growth, dried and weighed.

- All values reported are in kg/ha dry mass

III. Sphagnum moss NPP

1999 & 2000

- Sphagnum moss growth was measured as stated in the BigFoot Field Manual V2.1
 - Crank wires were installed in spring of 1999
 - They were then marked in the spring of 2000, for 1999 growth
 - Marked again at the end of the 2000 growing season, for 2000 growth
 - Then removed and brought back to the lab for measurement of linear growth on each crank wire

- We used Dr. Kari Bisbee's allometric equation for sphagnum moss relating frond mass to length. Also, we used her average #fronds/area (m²), which was 28,450. Her work was done in Southern Old Black Spruce in Saskatchewan, Canada.

NPP of sphagnum moss = growth (cm)/frond*mass (g)/frond length (cm)*# fronds/area (m²)

Equation relating frond mass(g) to frond length(cm):

$$\log_{10}(\text{mass}) = -2.12 + 0.50\log_{10}(\text{length})$$

- All values reported are in kg/ha dry mass

- Missing plot(s)
 - Plot 35(the hut) did not have any crank wires installed. This was due to the heavy foot travel that occurs at and around the hut.

IV. Feather moss NPP

1999 & 2000

- Feather moss growth was measured as stated in the BigFoot Field Manual V2.1
 - Mesh plots were installed in the spring of 1999.
 - One-half of the mesh plots were clipped in the spring of 2000, for 1999 growth, and moved to new sample area.
 - The other half were then clipped in the fall of 2000. These mesh plots had 2 years growth when clipped. The weight was divided by 2 (years of growth). We were more confident with the 2 year average due to the nature of the mesh plots.

- All values reported are in kg/ha dry mass

- Missing plot(s)
 - Plot 35(the hut) did not have any mesh plots installed. This was due to the heavy foot travel that occurs at and around the hut.

README for bf_nobs_lai_2000.tif****

This layer supercedes all versions released prior to Jan 01, 2003

1. General Information

Theme: Land Cover in IGBP Units
Theme Date: Year 2000
Project: BigFoot
Site: NOBS (Manitoba, Canada)
Biome: Boreal forest
Contact: Thomas.Maiersperger@orst.edu

2. Layer Information

Rows: 282
Cols: 282
Data Type: unsigned 8-bit thematic
Format: Geotiff

3. Map Information

ULX: 529191
ULY: 6196941
Pixel Size: 25
Units: meters
Projection: UTM
Spheroid: WGS84
Datum: WGS84
Zone: 14 North

4. Attribute Information

Pixel values are LAI estimates multiplied by 10 (e.g. a value of 55 = 5.5 LAI)

5. Additional Information

Some land classes were not modeled. For these pixels, default LAI values were inserted based on literature estimates or other information.

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Zone: 14 North

4. Attribute Information

1 Water
2 Urban/Built Up
3 Barren
4 Wetlands
5 Open Shrubland
6 Open Shrubland in 1981 Burn
7 Closed Shrubland in 1981 Burn
8 Savanna
9 Woody Savanna
10 Evergreen Needleleaf Forest
11 Deciduous Broadleaf Forest

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Datum: WGS84
Zone: 14 North

4. Attribute Information

Value	Class Name
1	Evergreen Needleleaf Forest
4	Deciduous Broadleaf Forest
6	Closed Shrubland
7	Open Shrubland
8	Woody Savanna
9	Savanna
11	Wetland
16	Barren
17	Water