GLOBE Carbon Cycle

Standard Shrub/Sapling Measurements – Student Field Guide

Shrub/Sapling Team – 2-3 people

Task

Use diagonal transects to collect a sub-sample of shrub/sapling data, height and # of hits (to estimate % cover) in order to calculate biomass and carbon stock using allometric equations.

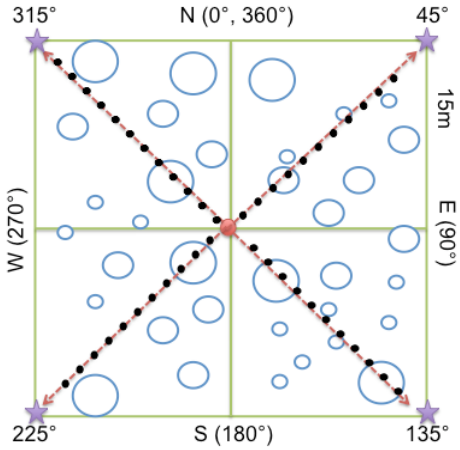
Definitions

- *Shrub* = a woody plant with multiple stems
- *Sapling* = a tree < 15 cm CBH

Materials

- ❑ Compass
- ❑ 2-3 m stick marked by centimeter
- ❑ Clinometer (optional)
- ❑ Pencil
- ❑ Calculator (optional)
- ❑ *Shrub/Sapling Data Sheet*

Procedure



1) Select one team member to stand at the center of the sample site with the compass. This person will keep other team members on the correct azimuth (diagonal transect), heading toward one of the sample site corners: NE, SE, SW, or NW.

2) Choose a team member to pace. The pacer should take 1 pace (two steps) and place the measuring stick straight down.

3) The data recorder should record the following in column 2 of the *Shrub/Sapling Data Sheet*:
   'H' if it is touching a shrub or sapling (go to step 5)
   'M' if it is not touching a shrub or sapling (leave the other columns blank, return to step 3)

4) If you recorded 'H' in column 2, in column 3 of the Standard *Shrub/Sapling Data Sheet* record:
   'E' if the species is an evergreen
   'D' if the species is deciduous

5) Use the measuring stick to measure a representative height of the whole shrub/sapling and record it in column 4 of the *Standard Shrub/Sapling Data Sheet*

6) Repeat steps 3-5 until you reach the corner.

7) Return to the center of the site and repeat steps 3-6 until all four directions have been measured.

A collaborative project between the University of New Hampshire, Charles University and the GLOBE Program Office. 2012

8) If your teacher directs you to, use the *Standard Shrub/Sapling Calculations Sheet.*

9) Now go to the *ShrubSaplingBiomass_Non-Standard* spreadsheet to enter data. This spreadsheet will then convert number of hits to percent cover of deciduous and evergreen shrubs. Percent cover and average shrub height will be used in allometric equations to determine biomass and carbon stock of shrubs/saplings on your sample site. Check out the Equations Tab to investigate this process on your own.

What do I do if…

…the shrub or sapling is taller than the height of the meter stick?

Option 1. Set the meter stick next to the shrub as a reference, and estimate the height.

Option 2. Use a clinometer following the instructions given to you by your teacher.

…the shrub is so big it covers multiple sample points?

Record it as a hit ('H') for each point it touches, but only record it's height in the data sheet once.

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GLOBE Carbon Cycle – Standard Shrub/Sapling Data Sheet

School: _____ Date: _____

Site Name: _____

Recorded By: _____

Sample #	Shrub/Sapling Presence (H=hit, M=miss)	Type (E = evergreen, D= deciduous)	Height (m)	Notes
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
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24				
25				
26				
27				
28				

Standard Shrub/Sapling Calculations

Use the data from the *Standard Shrub/Sapling Data Sheet* in the equations below (then go to the *ShrubSaplingBiomass* spreadsheet):

1. Calculate the variables needed for the equations:

Total number of observations = _____

Total number 'D' hits = _____

Total number 'E' hits = _____

Sum of the heights of 'D' hits only = _____

Sum of the heights of 'E' hits only = _____

2. Use the variables above in the equations below:

$$Deciduous\ \%\ cover = \frac{Total\ number\ 'D'\ hits}{Total\ number\ observations} \times 100$$

$$Deciduous\ average\ height\ (m) = \frac{Sum\ of\ heights\ of\ 'D'\ hits}{Total\ number\ 'D'\ hits}$$

$$Evergreen\ \%\ cover = \frac{Total\ number\ 'E'\ hits}{Total\ number\ observations} \times 100$$

$$Evergreen\ average\ height\ (m) = \frac{Sum\ of\ heights\ of\ 'E'\ hits}{Total\ number\ 'E'\ hits}$$