Tree height is an important part of tree inventory in forest survey and forest ecology research (Rennie 1979). In forest ecology, tree height can be a parameter in many allometric equations, such as diameter at breast height- height model and biomass equation (Wang 2005 and ). Therefore, determining the actual tree height is crucial (Rennie 1979). Generally, there are two ways to measure tree height. The first method involves tree climbers, who can climb at the top of a tree and use a tape to measure the tree. The other method is technology- involved, such as the laser dendrometers (Skovsgaard et al 1998). The precision of measuring tree height has been improved by the use of hypsometer (Curttis and Bruce 1968). Take Vertex III hypsometer as an example; it uses ultra sonic signals to determine distance. However, there is still inaccuracy associated with hypsometer (Morey 1931). Humidity, air pressure, surrounding noise and temperature can impact on the range and extension of the signal and thus affect the accuracy of the measurement (HaglÖf Sweden AB 2002).

In Bartlett Experimental Forest, we use Vertex III to measure tree height. In order to evaluate how accurate the Vertex III hypsometer is, we are going to compare the tree height which was measured when the tree was cut down and lying on the ground, assuming it is the true height, and tree height measured by Vertex III hypsometer. We are going to use standard deviation, etc. to evaluate the variation of Vertex III measurement.

Objective: To estimate the accuracy of tree measurement by Vertex III hypsometer.

Hypothesis: The difference between tree height which is measured by hypsometer and the true height will be in few centimeters.

Methods for the objective:

June 20th-June 21th, 2011: email Farrah Fetami to get field data on tree height. The tree height was measured by Farrah Fetami (time, location, diameter, etc) and trees were measured both by Vertex III hypsometer and tape after they were cut down.

June 22th-June 23th, 2011: type the data and email Farrah if I have any questions concerning about the data, such as when the data was collected and what exactly kind of hypsometer Farrah used when she measured the tree.

June 24th- June 26th, 2011: calculate the measurement error in tree height and evaluate the accuracy of hypsometer based on stand deviation and error analysis.

June 27th –June 30th, 2011: conduct a literature review and collect information on inaccuracy source.

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