
METRIC TIMBER TABLES FOR THE COMMERCIAL
TREE SPECIES OF CENTRAL AND EASTERN CANADA

by

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ABSTRACT

Metric timber tables are provided for 21 major commercial species of central and eastern Canada, based on a mathematical conversion of existing volume and diameter equations. Four types of tables are included 1) total volume, 2) merchantable volume (stump height of 0.15 m and top diameter inside bark of 7.0 cm), 3) ratios of merchantable volume to total volume for various stump heights, top diameters, and merchantable lengths, 4) diameters inside and outside bark for stump height, breast height and sections of the lower bole.

RESUME

On fournit les tarifs de cubage fondés sur la conversion mathématique d'équations existantes du volume et du diamètre pour 21 essences marchandes importantes du centre et de l'est du Canada. Ces tables sont de quatre types: 1) volume total, 2) volume marchand (hauteur de la souche de 0,15 m et diamètre au fin bout sans l'écorce de 7,0 cm), 3) rapport volume marchand/volume total pour divers diamètres au fin bout, hauteurs de la souche et longueurs marchandes, 4) diamètre avec et sans l'écorce en fonction de la hauteur de la souche, à hauteur d'homme et pour des sections du bas du fût.

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INTRODUCTION

In estimating the volume of forest trees and stands there is a need for species reference tables that show total and merchantable volume for various utilization limits. In addition, supplementary tables are required for estimating stump diameters and breast height diameters, both inside and outside bark, from measurements of radial growth and/or age. Such reference tables facilitate arithmetic calculations and the determination of quantitative estimates in both field and office and are necessary tools in the performance of forestry work.

For many years the Canadian Forestry Service has prepared numerous tables to fill this requirement. The Form-Class Volume Tables originally published in 1930 (Anon. 1930, 1948) were developed and used in Canada for estimating total and merchantable tree volumes. These tables used the ratio of diameter inside bark at one-half the height above breast height to diameter at breast height, inside bark, as an index of tree form and required, for their proper application, the use of local diameter/form-class curves. They were difficult to apply to a given stand because of the time and effort required to measure upper stem diameters, develop local diameter/form-class curves for each stand, and interpolate volumes between tabulated form classes.

To alleviate some of these problems, a set of standard total and merchantable tree volume equations was developed, which ignored form as an independent variable, was easier to apply, and could be easily incorporated in computer-based inventory systems (Honer 1967). They were based on the same data as the original Form-Class Volume Tables, with some additional measurements from various research and management studies.⁴ These data also provided the basis for the equations that established the relationships between stump height, breast height, and the associated diameters of the lower stem (Alemdag and Honer 1973), that are often used in reconstructing the volumes of stands following harvesting. Since the publication of these tables, the Canadian government has officially adopted the metric (SI) system of measurement, and through establishment of a Metric Commission, has coordinated and promoted the adoption of the metric system throughout the nation. Various aspects of metric conversion in forestry are discussed by Smith (1975), and Bruce (1979).

This report describes the development of the volume and diameter equations and their conversion to the metric system. It provides metric volume equations, diameter equations, and tables for 21 major commercial tree species of central and eastern Canada, based on a mathematical conversion of Honer's (1967) volume equations and those of Alemdag and Honer (1973, 1977) for estimating diameters at stump height, the lower bole, and at breast height. Numerous sets of tables are included in this report: 1) total cubic volume; 2) merchantable cubic volume to a stump height of 0.15 m and a top diameter inside bark of 7.0 cm; 3) ratios of merchantable to total volume for various stump heights, top diameters and merchantable lengths; 4) diameters inside and outside bark at stump height and breast height; and 5) useful conversion factors.

⁴These and other tree data were transferred to magnetic tape between 1964 and 1971 and are available on loan for research purposes from the Petawawa National Forestry Institute, Chalk River, Ont. (MacLeod 1978)

TOTAL STEM VOLUME EQUATION

The purpose of any total cubic volume equation is to express the volume-diameter-height relationship so that stem volume may be estimated from field measures of diameter and height. The expression must provide accurate estimates for all size classes, and the error associated with the estimates should be independent of tree size.

The total volume equation was derived as follows: since DBH is measured at a constant height (h) above ground level, this height represents a varying percentage of the total tree height, a large percentage for small trees and a small percentage for large trees. In the same manner, the volume to breast height on relatively small trees represents a large proportion of the total tree volume, while on large trees it represents a very small proportion. Therefore the ratio of the volume below breast height to total tree volume is related to the ratio of breast height to total tree height.

For example, the variables were expressed as D^2h/V and h/H and the relationship was later simplified and written as

$$D^2/V = a + b/H$$

and cubic volume is estimated from the equation

$$V = D^2/(a + b/H)$$

where D is diameter at breast height outside bark, H is total tree height, V is total cubic volume inside bark and a, b are regression coefficients. An evaluation of this and other functions has been presented (Honer 1965b).

MERCHANTABLE STEM VOLUME CONVERSION FACTORS

Foresters have long been faced with the problem of obtaining merchantable volumes for a variety of utilization levels involving different specifications for stump height, top diameter, or merchantable length. In past years, tables showing the percent of merchantable tree volume for logs of given length, as well as taper tables have been used to determine merchantable volume. However, merchantable cubic conversion factors can be computed from equations which describe the distribution of volume over the tree stem. These factors, when applied to the total cubic volume, provide an estimate of merchantable volume for the specified level of utilization (Honer 1964, 1965a). The four methods used to compute the merchantable conversion factors are described below.

Method 1: Height Ratio

A method to determine merchantable volume based on the height to the merchantable limit and an estimate of total volume was investigated. The height to the merchantable limit was represented by values of X_1 and volume by values of Y_1 where

X_1 = height to merchantable limit/total tree height

Y_1 = volume to merchantable limit/total tree volume.

The relationship between the volume and height ratios was established

$$Y_1 = a + bX_1 + cX_1^2$$

The equation can be modified to account for a stump volume deduction as follows:

Let X_1 represent the ratio of merchantable height to total height (Hm_1) and $X_{1,2}$ represent the ratio of stump height to total height (Hm_2).

$$(I) \text{ volume ratio to } Hm_1 = Y_1 = a + bX_1 + cX_1^2$$

$$(II) \text{ volume ratio to } Hm_2 = Y_{1,2} = a + bX_{1,2} + cX_{1,2}^2$$

(I-II) proportion of remaining volume equals

$$(Y_1 - Y_{1,2}) = b(X_1 - X_{1,2}) + c(X_1^2 - X_{1,2}^2)$$

$$\text{therefore } Y_1 - Y_{1,2} = b(X_1 - X_{1,2}) + c(X_1^2 - X_{1,2}^2)$$

This method permits one to derive merchantable volume conversion factors for any portion of the tree stem defined by two measures of merchantable height.

Method 2: Squared Diameter Ratio

Volume estimates are often required for specified top diameters and stump heights and in deriving a method to permit the determination of merchantable volume the following approach was used.

If a relationship between the ratios of squared diameters (X_2) and the ratios of volume to those diameters (Y_1) are known, then it would be possible to determine from a total volume estimate, the merchantable volume to a specified top diameter. The relationship could then be adjusted to account for the volume attributed to the stump section.

Let X_2 represent the ratio of squared diameters and Y_1 represent the ratios of volume to that merchantable diameter limit where:

$$X_2 = \text{merchantable top } D_{ib}^2 / DBH_{ob}^2$$

$$Y_1 = \text{volume to merchantable limit/total tree volume}$$

The relationship between the volume and squared diameter ratios was developed, but values representing the tree top, breast height, and sections below breast height were not included in the regression.

$$Y_1 = a + bX_2 + cX_2^2$$

Method 3: Adjusted Squared Diameter Ratio

To permit the deduction of stump volume it was necessary to adjust the basic data to reflect varying stump heights. The adjustment was accomplished as follows:

- (i) The stump volume ratio (stump volume/total volume) of each tree was subtracted from each section volume ratio. Adjusted volume ratios were designated as Y_2 .

therefore $Y_2 = Y_1 - (\text{stump volume/total volume})$.

- (ii) The squared diameter ratio of each section was increased by a factor representing the height of the tree above stump height. Adjusted ratios were designated as X_3 .

therefore $X_3 = X_2 (\text{total height} + \text{stump height})/\text{total height}$

and the following equation was subsequently developed

$$Y_2 = a + bX_3 + cX_3^2$$

The adjustment described above is a modification of a procedure reported earlier (Honer 1964), and the method permits one to derive merchantable volume conversion factors for specified top diameters and stump heights.

Method 4: Diameter - Height Ratio

The fourth method combines the two concepts and utilizes variables which include the top diameter and the height to that diameter in estimating the proportion of the total tree volume below the merchantable limit.

Let X_4 represent the ratio of diameters, X_5 the proportion of merchantable length and Y_1 represent the ratio of volume to that merchantable limit where:

$$X_4 = \text{merchantable top Dib/DBHob}$$

$$X_5 = (1 - (h_1/H))^2$$

$$Y_1 = \text{volume to merchantable limit/total tree volume}$$

$$h_1 = \text{height to merchantable top diameter}$$

$$H = \text{total tree height}$$

The relationship was expressed as

$$Y_1 = a + bX_4 + cX_5$$

and permits the derivation of merchantable volume conversion factors from measures or estimates of top diameter and length of the merchantable bole.

DERIVATION OF METRIC VOLUME EQUATIONS

Measurement Units and Notation

The variables, symbols, and measurement units used in deriving the metric volume equations are summarized in Table 1.

Conversion Factors

The conversion factors for the measurement units in Table 1 are

$$\begin{aligned} 1 \text{ cm} &= 0.393 \text{ 701 inch} \\ 1 \text{ m} &= 3.280 \text{ 84 feet} \\ 1 \text{ m}^3 &= 35.3147 \text{ ft}^3 \end{aligned}$$

The variables of Table 1 are related by these conversion factors:

$$D_e = 0.393 \text{ 701 } D_m \quad (1)$$

$$d_e = 0.393 \text{ 701 } d_m \quad (2)$$

$$H_e = 3.280 \text{ 84 } H_m \quad (3)$$

$$h_e = 3.280 \text{ 84 } h_m \quad (4)$$

$$S_e = 3.280 \text{ 84 } S_m \quad (5)$$

$$DS_e = 0.393 \text{ 701 } DS_m \quad (6)$$

$$t_e = 0.393 \text{ 701 } t_m \quad (7)$$

$$V_e = 35.3147 V_m \quad (8)$$

$$VM_e = 35.3147 VM_m \quad (9)$$

Diameter Conversion

Since tree diameter in the metric system is measured at 1.30 m rather than 4.5 ft, we need an estimate of the ratio of these two diameters before development of the conversion process can proceed. A taper model developed for estimating diameter at breast height outside bark (DBHob) from stump diameter (Alemdag and Honer 1973, 1977) was used to relate d_m and D_e .

The original taper model was

$$D_e = DS_e + b_2 DS_e \ln ((S_e + 1)/5.5) \quad (10)$$

where b_2 is a regression coefficient and \ln is the natural logarithm.

Substituting Eq. (6) and (5) in (10) gives

$$D_e = 0.393\ 701\ DS_m (1 + b_2 \ln ((3.280\ 84\ S_m + 1)/5.5)) \quad (11)$$

If $S_m = 1.30\ m$, then $DS_m = d_m$ and

$$D_e = 0.393\ 701\ d_m (1 - 0.043\ 65\ b_2) \quad (12)$$

which is the desired relationship between D_e and d_m .

The eleven taper coefficients (b_2) published by Alemdag and Honer (1973) are given in Table 2, along with the weighted average coefficients for softwoods, hardwoods, and all species combined.

Total Volume Equation

The total volume equation is

$$V_e = D_e^2 / (c_1 + (c_2/H_e)) \quad (13)$$

where c_1 and c_2 are regression coefficients (Table 3). To obtain a metric equivalent of this equation we substitute the diameter relationship (Eq. 12) and the appropriate conversion factors (3) and (8) in Eq. 13 (Demaershalk 1972):

$$V_m = 0.004\ 389\ 1\ d_m^2 (1 - 0.043\ 65\ b_2)^2 / (c_1 + (0.3048c_2/H_m)) \quad (14)$$

Merchantable Volume Equations

The four methods used to compute the merchantable volume are related to their metric counterparts as follows:

1) Height ratio method:

This method defines merchantable volume in terms of height to the merchantable limit:

$$VM_e = V_e (p_1 + p_2 X_1 + p_3 X_1^2) \quad (15)$$

where p_1 , p_2 , and p_3 are regression coefficients, and $X_1 = h_e/H_e$
The metric version of this equation is

$$VM_m = V_m (p_1 + p_2 (h_m/H_m) + p_3 (h_m/H_m)^2) \quad (16)$$

This method can also be used to develop a merchantable volume equation using stump height and height to merchantable limit as independent variables:

$$VM_e = V_e (p_2 ((h_e/H_e) - (S_e/H_e)) + p_3 ((h_e/H_e)^2 - (S_e/H_e)^2)) \quad (17)$$

The metric version of this equation has identical form since the conversion factors cancel out:

$$VM_m = V_m (p_2 ((h_m/H_m) - (S_m/H_m)) + p_3 ((h_m/H_m)^2 - (S_m/H_m)^2)) \quad (18)$$

The coefficients p_1 , p_2 , and p_3 for this method are listed in Table 4.

2) Squared diameter ratio method:

This equation gives merchantable volume in terms of top diameter inside bark and DBH:

$$VM_e = V_e (q_1 + q_2 X_2 + q_3 X_2^2) \quad (19)$$

where q_1 , q_2 , and q_3 are regression coefficients, and $X_2 = (t_e/D_e)^2$.

The metric version of this equation is obtained by substituting (7), (8), (9), and (12) in (19):

$$VM_m = V_m (q_1 + q_2 X_2 + q_3 X_2^2) \quad (20)$$

where $X_2 = t_m^2 d_m^{-2} (1 - 0.04365 b_2)^{-2}$ and coefficients q_1 , q_2 , and q_3 for this method are given in Table 5.

3) Adjusted squared diameter ratio method:

This is a modification of method 2) and gives merchantable volume as a function of top diameter inside bark and stump height:

$$VM_e = V_e (r_1 + r_2 X_3 + r_3 X_3^2) \quad (21)$$

where $X_3 = (t_e/D_e)^2 (1 + S_e/H_e)$

r_1 , r_2 , r_3 = regression coefficients.

The metric equivalent of (21) is obtained by substitution of (3), (5), (7), (8), (9), and (12) in (21):

$$VM_m = V_m (r_1 + r_2 X_3 + r_3 X_3^2) \quad (22)$$

where $X_3 = t_m^2 d_m^{-2} (1 - 0.04365 b_2)^{-2} (1 + S_m/H_m)$.

The coefficients r_1 , r_2 , and r_3 for this method are listed in Table 6.

This method was used to produce a set of merchantable cubic metre volume tables for the 21 species (Appendix II) using a top diameter of 7.0 cm

inside bark and stump height of 0.15 m.

4) Diameter - height ratio method:

The fourth approach expresses merchantable volume as a function of top diameter inside bark and height to merchantable limit:

$$VM_e = V_e (Z_1 + Z_2 X_4 + Z_3 X_5) \quad (23)$$

where Z_1 , Z_2 , and Z_3 are regression coefficients, $X_4 = (t_e/D_e)$, and

$$X_5 = (1-h_e/H_e)^2$$

The metric version of this equation is obtained by substitution of (3), (4), (7), (8), (9), and (12) in (23):

$$VM_m = V_m (Z_1 + Z_2 X_4 + Z_3 X_5) \quad (24)$$

where $X_4 = t_m d_m^{-1} (1 - 0.04365 b_2)^{-1}$; $X_5 = (1-h_m/H_m)^2$ and coefficients Z_1 , Z_2 , and Z_3 are listed in Table 7.

METRIC VOLUME TABLES AND CONVERSION FACTORS

Total Cubic Metre Volume Tables

Total volume tables are presented in Appendix I and show volume in cubic metres of the entire stem inside bark including stump and top for 2-cm classes of diameter outside bark at breast height of 1.30 m, and selected tree heights. No allowances have been made for defect, trim, or breakage.

The total volume table for each species was computed using Equation 14 and the coefficients of Table 3. They show the volume equation, coefficients, accuracy at the 95% level, sample locations and number of trees observed.

Merchantable Cubic Metre Volume Tables

Merchantable volume tables are presented in Appendix II and show volume in cubic metres inside bark, less stump and top, for 2-cm classes of diameter outside bark at breast height of 1.30 m, and for selected tree heights. The specified merchantable limits are a 7.0 cm top diameter inside bark and a stump height of 0.15 m. No allowances have been made for defect, trim, or breakage. Conversion factors developed from method 3 (adjusted squared diameter ratio) and the species, softwood and hardwood coefficients applied to the volume equations were used to construct these tables.

Merchantable Cubic Metre Conversion Factors

Appendix III contains a set of tables giving the ratio of merchantable volume to total volume for different stump heights, top diameters, and merchantable lengths.

A table showing the distribution of volume over the tree stem is presented. The proportions of total tree volume are shown for ratios of section length to total tree height, and the squared ratio of top diameter inside bark to diameter breast height outside bark. The ratios are derived from the 'all species' coefficients of Tables 4 and 5 developed for the height ratio method and the squared diameter ratio method.

Appendix III also contains tables showing the proportion of total volume that can be recovered when merchantable limits are in terms of stump heights at 0.15 m and 0.30 m, merchantable lengths as a ratio of total tree height and the height classes are specified. These tables are useful in determining the merchantable volume of trees having damaged or broken tops.

The adjusted squared diameter ratio method and the all species coefficients of Table 6 were used to compute the ratios of merchantable volume to total volume for stump heights of 0.15 and 0.30 m and top diameters inside bark of 7.0, 11.0, 15.0, 19.0, 23.0 and 27.0 cm. These stump heights are characteristic of current harvesting practice and the diameters represent the lower limits of the 2-cm classes used in measuring logs for scaling purposes (Canadian Standards Association, 1977).

Accuracy

Tests of accuracy were performed in Canadian yard/pound units. In converting to metric systems, no further tests were undertaken as it is assumed that the error statements are generally applicable to both measurement systems.

1) Taper Coefficients

Ker (1974) discussed some of the errors associated with the b_2 taper coefficients and concluded that large changes in them produce very small changes in the volume estimates. However, in the absence of detailed tests the volume tables were derived using coefficients specific to each species. Where no coefficients were available, the 'all species' values were used.

2) Total Cubic Volume Tables

Accuracy limits are shown for each total cubic volume table and were computed in the manner described by Freese (1960). The limits at the 95% level are shown in percentages.

For the data used in constructing the table, the tabular volume estimates are within plus or minus P units of the true volume. For example, the tabular estimates of total cubic volume for individual lodgepole pine were within plus or minus 15.2% of the true volume 95% of the time.

3) Merchantable Volume Tables and Conversion Factors

Because it is difficult to estimate accuracy for every combination of stump height and top diameter, no limits are shown on the merchantable

volume tables or on the tables of merchantable conversion factors. However, tests were conducted on a limited amount of data and a description of the method follows.

For each of 10 species, 80 trees were selected at random and from the section measurements of each tree a merchantable top was randomly selected. Using the merchantable cubic conversion functions for each species, the softwoods, the hardwoods, and an expression for softwoods and hardwoods combined, the merchantable volume for each tree was computed using

- (1) the total cubic volume as determined from the species total volume equation, and the conversion factor equations,
- (2) the observed total cubic foot volume as determined from the sum of the section volumes, and the conversion factor equations.

The accuracy at the 95% level was determined and Tables 4 to 7 show the results for each method. In reviewing the accuracy statements it should be noted that those listed under column 1, incorporate the errors associated with the total volume function as well as those of the conversion factor equation. Those listed under column 2, incorporate the errors of the conversion factor equation only.

Application

A white pine tree has the following measurements and specifications: diameter breast height outside bark (d) is 40.2 cm; total height (H) is 25.60 m; stump height (S) is 0.45 m. The tree contains one sawlog of 15.00 m in length, the upper limit (h_1) being located at 18.00 m and the lower limit (h_2) at 3.00 m above ground level. Determine the total stem volume (V), the merchantable volume, the sawlog volume, and the merchantable volume to a top diameter inside bark (t) of 8.0 cm.

Total stem volume: Equation 14

$$V = 0.0043891 d^2 (1 - 0.04365 b_2)^2 / (c_1 + 0.3048 c_2 / H)$$

$$b_2 = 0.184$$

$$c_1 = 0.691$$

$$c_2 = 363.676$$

$$d = 40.2 \text{ cm}$$

$$H = 25.60 \text{ m}$$

$$V = 1.390 \text{ m}^3$$

Sawlog volume: Equation 18

$$V_s = V(p_2((h_1/H) - (h_2/H)) + p_3((h_1/H)^2 - (h_2/H)^2))$$

$$V = 1.390 \text{ m}^3$$

$$p_2 = 2.1164$$

$$p_3 = -1.1387$$

$$h_1 = 18.00 \text{ m}$$

$$h_2 = 3.00 \text{ m}$$

$$H = 25.60 \text{ m}$$

$$V_s = 0.963 \text{ m}^3$$

Merchantable stem volume: Equation 22

$$VM = V(r_1 + r_2 X_3 + r_3 X_3^2)$$

$$X_3 = t^2 d^{-2} (1 - 0.04365 b_2)^{-2} (1 + S/H)$$

$$V = 1.390 \text{ m}^3$$

$$r_1 = 0.9735$$

$$r_2 = -0.2348$$

$$r_3 = -0.7378$$

$$t = 8.0 \text{ cm}$$

$$d = 40.2 \text{ cm}$$

$$b_2 = 0.184$$

$$S = 0.45 \text{ m}$$

$$H = 25.60 \text{ m}$$

$$V_m = 1.338 \text{ m}^3$$

Volume summary

Total volume 1.390 m³

Merchantable volume 1.338 m³

Sawlog volume 0.963 m³

Pulp volume 0.375 m³

Unmerchantable volume 0.052 m³

BREAST HEIGHT AND STUMP DIAMETER EQUATIONS

In almost every phase of forestry, breast-height diameter is one of the commonly used measurements. It is needed to establish tree size, to estimate basal area, volume, mass and increment of trees, and to describe stand structure. Breast-height diameter is generally measured directly, however in some cases it must be estimated from other measured variables such as stump-height diameter. For instance, when it is necessary to compute the volume of a stand removed following a harvesting operation, the conversion from stump diameter and stump height to breast-height diameter would be required to apply the appropriate local volume table. On the other hand, the estimation of stump diameter from breast-height diameter may be required to evaluate close utilization limits associated with mechanized harvesting techniques.

Model Development

The radius of the bole at stump height ($DS_e/2$) and breast height ($D_e/2$) were plotted against stump height plus one ($S_e+1.0$) for individual sample trees. Since it was found that the curve shape of the lower trunk varies with D_e as well as with the logarithm of the ratio of breast height plus 1.0 to stump height plus 1.0, a combined variable was used in developing the equations of the following forms:

$$DS_e = D_e + b_1 D_e \ln(5.5/(S_e + 1)) \quad (25)$$

$$D_e = DS_e + b_2 DS_e \ln((S_e + 1)/5.5) \quad (26)$$

Double bark thickness was assumed to be in the form

$$dbt_e = a + b D_e \quad (27)$$

and subtracting from both sides of Eq. (25) gives

$$DSI_e = b_3 + b_4 D_e + b_5 D_e \ln(5.5/(S_e + 1)) \quad (28)$$

In the same way, the expression for breast height diameter outside bark was written as

$$D_e = b_6 + b_7 DSI_e + b_8 DSI_e \ln((S_e + 1)/5.5) \quad (29)$$

Metric Diameter Equations

The conversion of equations 25, 26, 28, 29 is accomplished as follows:

$$\text{Let } \ln(5.5/(S_e + 1)) = \ln(5.5/(3.28084 S_m + 1)) \quad (30)$$

$$\text{and } \ln((S_e + 1)/5.5) = \ln((3.28084 S_m + 1)/5.5) \quad (31)$$

$$DSI_e = 0.393701 DSI_m \quad (32)$$

Substituting Eq. (6), (12), and (30) in (25); Eq. (6), (12), and (31) in (26); Eq. (32), (12), and (30) in (28); Eq. (32), (12), and (31) in (29) gives

$$DS_m = d_m (1 - 0.04365 b_2) \left(1 + b_1 \ln \left(1.6764 / \left(\hat{S}_m + 0.3048 \right) \right) \right) \quad (33)$$

$$d_m = DS_m \left(1 + b_2 \ln \left(\left(\hat{S}_m + 0.3048 \right) / 1.6764 \right) \right) / (1 - 0.04365 b_2) \quad (34)$$

$$DSI_m = b_3 + d_m (1 - 0.04365 b_2) \left(\hat{b}_4 + b_5 \ln \left(1.6764 / \left(\hat{S}_m + 0.3048 \right) \right) \right) \quad (35)$$

$$d_m = \left(\hat{b}_6 + DSI_m \left(\hat{b}_7 + b_8 \ln \left(\left(\hat{S}_m + 0.3048 \right) / 1.6764 \right) \right) \right) / (1 - 0.04365 b_2) \quad (36)$$

The coefficients b_1 to b_8 for these diameter equations are listed in Table 8, and were used to produce the outside and inside bark diameters at various stump heights for Appendices IV to VII. Note that, for

$$S_m = 1.30 \text{ m,}$$

$$\text{Eq. 33 produces } DS_m = d_m,$$

$$\text{Eq. 34 produces } d_m = DS_m,$$

$$\text{Eq. 35 simplifies to } DSI_m = b_3 + k_1 d_m, \text{ and}$$

$$\text{Eq. 36 simplifies to } d_m = (b_6 + k_2 DSI_m) / k_3,$$

$$\text{where } k_1 = k_3 (b_4 + 0.04365 b_5)$$

$$k_2 = b_7 - 0.04365 b_8$$

$$k_3 = 1 - 0.04365 b_2$$

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REFERENCES

- Alemdag, I.S. and Honer T.G. 1973. Relationships between breast-height and stump diameters for eleven tree species from eastern and central Canada. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-49
- Alemdag, I.S. and Honer T.G. 1977. Metric relationships between breast-height and stump diameters for eleven tree species from eastern and central Canada. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-49M
- Anon. 1930. Form-Class Volume Tables. For. Serv. Dep. Int., Ottawa, Canada
- Anon. 1948. Form-Class Volume Tables (2nd ed.)
Dom. For. Serv., Dep. Mines Res., Ottawa, Canada
- Bruce, D. 1979. Effects of metrication on analyses and summaries of forest measurements. pp. 812-829 In Forest Resource Inventories Workshop Proceedings, Colorado State University, Fort Collins, Colorado, July 23-26, 1979.
- Canadian Standards Association, 1977. Standard CAN3-0302.1-M77,
Scaling Roundwood. Canadian Standards Association, Rexdale, Ontario
- Damaerschalk, J.P. 1972. Conversion of taper and volume equations from the English to the metric system. Can. J. For. Res. 2: 372-374
- Freese, F. 1960. Testing Accuracy. Forest Sci., 6:130-145
- Honer, T.G. 1964. The use of height and squared diameter ratios for the estimation of merchantable cubic foot volume. For. Chron. 40:324-331
- Honer, T.G. 1965a. Volume distribution in individual trees. Woodlands Review Section, Pulp and Paper Magazine of Canada. Woodlands Section Index 2349 (F-2).
- Honer, T.G. 1965b. A new total cubic foot volume function. For. Chron., 41: 476-493.
- Honer, T.G. 1967. Standard volume tables and merchantable conversion factors for the commercial tree species of central and eastern Canada. Can. Dep. For. Rural Dev., For. Manage. Res. and Serv. Inst., Inf. Rep. FMR-X-5
- Ker, M.F. 1974. Metric tree volume tables for Newfoundland. Can. For. Serv., Nfld. For. Res. Cent., Inf. Rep. N-X-122
- MacLeod, D.A. 1978. The Forest Management Institute tree data bank. Can. For. Serv., For. Manage. Inst., Inf. Rep. FMR-X-112
- Smith, B.M. 1975. Metric conversion.
In Canadian Forest Inventory Methods, Workshop Proceedings, June 1975, Dorset, Ontario. University of Toronto Press.

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Table 1. Variables, symbols and measurement units used in derivation of metric volume equations

Variable	Symbol		Measurement units	
	English	Metric	English	Metric
1) Diameter outside bark at 4.5 ft. above ground	D_e	D_m	inches	cm
2) Diameter outside bark at 1.3 m above ground	d_e	d_m	inches	cm
3) Total height	H_e	H_m	feet	m
4) Height to merchantable limit	h_e	h_m	feet	m
5) Stump height	S_e	S_m	feet	m
6) Stump diameter outside bark	DS_e	DS_m	inches	cm
6.1) Stump diameter inside bark	DSI_e	DSI_m	inches	cm
7) Top diameter inside bark	t_e	t_m	inches	cm
8) Total volume	V_e	V_m	cubic feet	m^3
9) Merchantable volume	VM_e	VM_m	cubic feet	m^3

Table 2. Regression coefficients for Alemdag and Honer's (1973) taper model; equation 10

Species	No. of observations	Regression coefficient b_2	R^2	Standard error of estimate	
				$S_{y.x}$	% of \bar{Y}
Eastern white pine	599	0.184	0.996	0.896	7.04
Red pine	740	0.151	0.997	0.573	6.07
Jack pine	1472	0.151	0.996	0.483	7.00
Lodgepole pine	748	0.118	0.997	0.500	5.44
Black spruce	723	0.164	0.996	0.454	6.42
Red spruce	73	0.169	0.997	0.506	6.05
White spruce	646	0.176	0.993	0.972	9.34
Balsam fir	355	0.152	0.997	0.463	5.95
Poplar	541	0.127	0.996	0.575	6.75
White birch	149	0.176	0.996	0.558	6.59
Yellow birch	151	0.181	0.995	0.883	7.76
Mean softwood*	-	0.155	-	-	-
Mean hardwood*	-	0.145	-	-	-
Mean all species*	-	0.154	-	-	-

Equation 10: $D_e = DS_e + b_2 DS_e \ln((S_e + 1)/5.5)$

where D_e = DBHob at 4.5 ft; DS_e = diameter outside bark at stump height; S_e = stump height; \ln = natural logarithm.

* b_2 is the weighted average

Table 3. Regression coefficients for Honer's (1967) total cubic meter volume equation, and equation 14

Species	No. of Trees	Regression coefficients			% Accuracy*
		b_2	c_1	c_2	
White pine	1169	0.184	0.691	363.676	± 16.5
Red pine	1333	0.151	0.710	355.623	± 17.3
Jack pine	6166	0.151	0.897	348.530	± 15.5
Lodgepole pine	850	0.118	0.694	343.896	± 15.2
Black spruce	7442	0.164	1.588	333.364	± 17.0
Red spruce	227	0.169	1.226	315.832	± 13.6
White spruce	2692	0.176	1.440	342.175	± 17.9
Balsam fir	2768	0.152	2.139	301.634	± 17.8
Eastern white cedar	187	0.155	4.167	244.906	± 16.4
Eastern hemlock	383	0.155	1.112	350.092	± 23.6
Trembling aspen	800	0.127	-0.312	436.683	± 17.9
Balsam poplar	2421	0.127	0.420	394.644	± 18.3
White birch	1272	0.176	2.222	300.373	± 22.5
Yellow birch	1733	0.181	1.449	344.754	± 34.3
Maple	3967	0.145	1.046	383.972	± 30.3
Basswood	140	0.145	0.948	401.456	± 25.5
Beech	388	0.145	0.959	334.829	± 25.1
Black cherry	21	0.145	0.033	393.336	± 19.8
White elm	62	0.145	0.634	440.496	± 28.1
Ironwood	147	0.145	1.877	332.585	± 23.6
Red oak	40	0.145	1.512	336.509	± 13.8

*Freese, F. 1960. Testing Accuracy. For. Sci. 6: 130-145.

Equation 14. $V_m = 0.0043891 d_m^2 (1 - 0.04365 b_2)^2 / (c_1 + (0.3048c_2/H_m))$

where V_m = total cubic volume; d_m = DBHob; H_m = total height.

Table 4. Merchantable volume conversion factor coefficients for height ratio method; equation 15

Species	Regression coefficients			R ²	Standard error of estimate	% Accuracy * $\frac{1}{2}$
	b ₂	P ₁	P ₂			
White pine	0.184	0.0145	2.1164	- 1.1387	99.42	0.025 ± 15.8 ± 5.6
Red pine	0.151	0.0145	2.0347	- 1.0473	99.18	0.029 ± 14.9 ± 4.4
Jack pine	0.151	0.0760	1.6446	- 0.6019	96.81	0.057 ± 23.4 ± 8.4
Lodgepole pine	0.118	0.0098	2.0442	- 1.0562	99.40	0.025 ± 12.6 ± 5.8
Black spruce	0.164	0.0204	2.1534	- 1.1918	99.55	0.021 ± 15.1 ± 3.4
Red spruce	0.169	0.0202	2.1149	- 1.1465	99.33	0.025 Not tested
White spruce	0.176	0.0236	2.2191	- 1.2705	99.46	0.024 ± 17.2 ± 5.0
Balsam fir	0.152	0.0117	2.1931	- 1.2230	99.53	0.021 ± 17.1 ± 7.8
Softwoods	0.155	0.0155	2.1158	- 1.1419	99.22	0.028 ± 17.6 ± 6.0
Poplar	0.127	0.0085	2.0945	- 1.1055	99.44	0.022 ± 10.8 ± 6.2
White birch	0.176	0.0232	2.2582	- 1.3268	98.44	0.035 ± 25.7 ± 7.1
Yellow birch	0.181	0.0248	2.4729	- 1.6199	97.80	0.042 ± 30.6 ± 7.5
Hardwoods	0.145	0.0161	2.2378	- 1.2990	97.94	0.042 ± 24.1 ± 9.3
All species	0.154	0.0159	2.1331	- 1.1631	99.02	0.031 ± 19.9 ± 7.4

Percent accuracy: column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 16. $VM_m = V_m (p_1 + p_2 (h_m/H_m) + p_3 (h_m/H_m)^2)$

where VM_m = merchantable volume; V_m = total cubic volume; h_m = height to merchantable limit; H_m = total height.

Table 5. Merchantable volume conversion factor coefficients for squared diameter ratio method; equation 20

Species	Regression coefficients				R ²	Standard error of estimate	% Accuracy
	b ₂	q ₁	q ₂	q ₃			
White pine	0.184	1.0180	-0.2323	- 0.7736	87.27	0.080	± 23.2 ± 10.7
Red pine	0.151	1.0073	-0.0461	- 1.0794	89.73	0.072	± 21.7 ± 9.4
Jack pine	0.151	1.0081	-0.1476	- 0.8455	89.17	0.072	± 22.2 ± 7.8
Lodgepole pine	0.118	1.0130	-0.1254	- 0.8553	91.99	0.062	± 17.4 ± 6.1
Black spruce	0.164	1.0038	-0.1022	- 0.8572	93.39	0.055	± 19.7 ± 6.0
Red spruce	0.169	1.0086	-0.1014	- 0.7933	88.94	0.067	Not tested
White spruce	0.176	1.0114	-0.2422	- 0.7177	91.76	0.061	± 22.5 ± 7.6
Balsam fir	0.152	0.9976	-0.0532	- 0.8439	94.84	0.048	± 21.6 ± 9.5
Softwoods	0.155	1.0119	-0.1642	- 0.8289	89.88	0.070	± 23.2 ± 9.3
Poplar	0.127	0.9794	0.0787	- 1.1865	94.29	0.059	± 21.1 ± 13.8
White birch	0.176	1.0060	-0.2687	- 0.6071	84.82	0.087	± 31.3 ± 11.0
Yellow birch	0.181	0.9921	-0.2492	- 0.5793	86.28	0.080	± 34.8 ± 8.9
Hardwoods	0.145	0.9928	-0.1184	- 0.8565	88.49	0.080	± 31.4 ± 11.8
All species	0.154	1.0106	-0.1641	- 0.8266	89.78	0.071	± 26.8 ± 10.3

Per cent accuracy: column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 20: $V_m = V_m(q_1 + q_2 X_2 + q_3 X_2^2)$

where V_m = merchantable volume; V_m = total cubic volume; X_2 = $t_m^2 d_m^{-2} (1 - 0.043 65 b_2)^{-2}$
 t_m = top diameter inside bark; d_m = DBHob.

Table 6. Merchantable volume conversion factor coefficients for adjusted squared diameter ratio method; equation 22

Species	Regression coefficients			R ²	Standard error of estimate	% Accuracy*
	b ₂	r ₁	r ₃			
White pine	0.184	0.9735	- 0.7378	86.20	0.083	± 24.6 ± 12.1
Red pine	0.151	0.9672	- 1.0523	89.18	0.074	± 22.5 ± 10.4
Jack pine	0.151	0.9635	- 0.8081	88.49	0.074	± 24.4 ± 11.3
Lodgepole pine	0.118	0.9658	- 0.8108	91.59	0.064	± 18.1 ± 7.1
Black spruce	0.164	0.9526	- 0.8199	92.84	0.057	± 20.7 ± 7.3
Red spruce	0.169	0.9644	- 0.0995	88.61	0.068	Not tested
White spruce	0.176	0.9611	- 0.6801	91.54	0.062	± 21.9 ± 7.4
Balsam fir	0.152	0.9352	- 0.8147	93.95	0.052	± 20.9 ± 6.8
Softwoods	0.155	0.9645	- 0.1616	89.09	0.072	± 23.7 ± 10.1
Poplar	0.127	0.9354	0.0957	93.68	0.062	± 22.6 ± 15.0
White birch	0.176	0.9087	- 0.3049	82.25	0.095	± 35.7 ± 15.4
Yellow birch	0.181	0.8778	- 0.2417	83.32	0.089	± 39.2 ± 14.0
Hardwoods	0.145	0.9057	- 0.0708	86.15	0.087	± 37.6 ± 16.3
All species	0.154	0.9604	- 0.1660	88.66	0.076	± 31.1 ± 13.5

*Per cent accuracy: Column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 22: $VM_m = V_m(r_1 + r_2 X_3 + r_3 X_3^2)$

where VM_m = merchantable volume; V_m = total cubic volume; $X_3 = t_m^{-2} d_m^{-2} (1 - 0.043 65 b_2)^{-2} (1 + S_m/H_m)$
 t_m = top diameter inside bark; d_m = DBHob; S_m = stump height; H_m = total height.

Table 7. Merchantable volume conversion factor coefficients for diameter-height ratio method; equation 24

Species	Regression coefficients			R ²	Standard error of estimate	% Accuracy*	
	b ₂	Z ₁	Z ₂			Z ₃	1
White pine	0.184	1.0120	0.0291	- 1.0012	98.35	0.029	± 15.6 ± 5.8
Red pine	0.151	1.0244	-0.0303	- 0.9620	97.97	0.032	± 15.7 ± 4.6
Jack pine	0.151	1.1439	-0.4059	- 0.5165	86.98	0.079	± 25.4 ± 9.6
Lodgepole pine	0.118	1.0277	-0.0451	- 0.9461	98.57	0.026	± 13.0 ± 5.6
Black spruce	0.164	1.0099	0.0376	- 0.9826	98.68	0.024	± 15.3 ± 4.0
Red spruce	0.169	1.0088	0.0293	- 0.9828	98.25	0.026	Not tested
White spruce	0.176	1.0133	0.0478	- 0.9699	98.26	0.028	± 17.4 ± 5.0
Balsam fir	0.152	1.0116	0.0470	- 1.0019	98.54	0.025	± 17.4 ± 8.2
Softwoods	0.155	1.0222	-0.0072	- 0.9597	97.91	0.032	± 18.1 ± 6.2
Poplar	0.127	1.0444	-0.0395	- 0.9790	99.06	0.024	± 11.4 ± 5.8
White birch	0.176	1.0823	-0.0819	- 0.9057	97.20	0.037	± 27.7 ± 7.2
Yellow birch	0.181	1.1157	-0.1204	- 0.8526	95.53	0.046	± 34.6 ± 7.7
Hardwoods	0.145	1.0979	-0.1285	- 0.8925	96.54	0.044	± 27.1 ± 8.5
All species	0.154	1.0297	-0.0211	- 0.9462	97.57	0.035	± 20.4 ± 7.7

*Percent accuracy: Column 1 incorporates the errors associated with the total volume equation as well as the conversion factor equation. Column 2 figures based on conversion factor errors only.

Equation 24: $VM_m = V_m(Z_1 + Z_2X_4 + Z_3X_5)$

VM_m = merchantable volume; V_m = total cubic volume; $X_4 = t_m d_m^{-1} (1-0.043 65 b_2)^{-1}$;

$X_5 = (1-h_m/H_m)^2$; t_m = top diameter inside bark; d_m = DBHob

h_m = height to merchantable limit; H_m = total height.

Table 8. Regression coefficients for stump and breast height diameters; equations 33 to 36

Tree species	Regression coefficients							
	b_1	b_2	b_3	b_4	b_5	b_6	b_7	b_8
Eastern white pine	0.216	0.184	0.036	0.916	0.188	0.617	1.072	0.190
Red pine	0.178	0.151	0.196	0.913	0.148	0.135	1.082	0.151
Jack pine	0.176	0.151	-0.455	0.961	0.118	0.721	1.027	0.117
Lodgepole pine	0.130	0.118	-0.338	0.966	0.114	0.490	1.028	0.112
Black spruce	0.194	0.164	-0.478	0.965	0.168	0.937	1.013	0.157
Red spruce	0.201	0.169	-0.185	0.953	0.193	0.424	1.037	0.177
White spruce	0.206	0.176	-0.843	0.984	0.190	1.372	0.997	0.169
Balsam fir	0.176	0.152	-0.333	0.962	0.127	0.960	1.008	0.122
Poplar spp.	0.140	0.127	-0.693	0.964	0.111	0.853	1.032	0.114
White birch	0.196	0.176	0.112	0.942	0.175	0.241	1.045	0.174
Yellow birch	0.198	0.181	-0.071	0.946	0.183	0.577	1.040	0.185
Mean softwood*	0.181	0.155	-0.332	0.953	0.146	0.716	1.033	0.142
Mean hardwood*	0.160	0.145	-0.439	0.957	0.135	0.695	1.036	0.137
Mean all species*	0.178	0.154	-0.346	0.954	0.145	0.713	1.033	0.141

Equation 33: $DS_m = d_m(1 - 0.04365b_2)(1 + b_1 \ln(1.6764/(S_m + 0.3048)))$.

Equation 34: $d_m = DS_m(1 + b_2 \ln((S_m + 0.3048)/1.6764))/(1 - 0.04365b_2)$.

Equation 35: $DSI_m = b_3 + d_m(1 - 0.04365b_2)(b_4 + b_5 \ln(1.6764/(S_m + 0.3048)))$.

Equation 36: $d_m = (b_6 + DSI_m(b_7 + b_8 \ln((S_m + 0.3048)/1.6764)))/(1 - 0.04365b_2)$.

where DS_m = diameter outside bark at stump height

DSI_m = diameter inside bark at stump height

S_m = stump height

d_m = DBHob at 1.30 m

\ln = natural logarithm

*weighted averages.

APPENDIX I Total Cubic Metre Volume Tables

SPECIES	PAGE
Eastern white pine (<u>Pinus strobus</u> L.)	24
Red pine (<u>Pinus resinosa</u> Ait.)	25
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Beech (<u>Fagus grandifolia</u> Ehrh.)	40
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Ironwood (<u>Ostrya virginiana</u> (Mill.) K. Koch)	43
Red oak (<u>Quercus rubra</u> L.)	44

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TCP INCLUDED)
 EASTERN WHITE PINE / PINUS STROBUS L.

DEPTH CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.023	0.025	0.075	0.081	0.165	0.193
4	0.003	0.006	0.009	0.009	0.040	0.044	0.148	0.159	0.216	0.252
6	0.012	0.013	0.019	0.020	0.063	0.069	0.244	0.264	0.273	0.319
8	0.019	0.023	0.034	0.036	0.091	0.100	0.302	0.325	0.337	0.394
10	0.027	0.037	0.053	0.057	0.124	0.136	0.365	0.394	0.408	0.477
12	0.037	0.053	0.077	0.082	0.161	0.177	0.434	0.469	0.485	0.566
14	0.048	0.072	0.105	0.111	0.204	0.224	0.510	0.550	0.570	0.656
16		0.094	0.137	0.145	0.252	0.274	0.678	0.732	0.758	0.886
18		0.119	0.173	0.184	0.305	0.335	0.772	0.838	0.863	1.008
20		0.147	0.214	0.227	0.363	0.399	0.871	0.940	0.974	1.138
22		0.178	0.259	0.274	0.426	0.468	0.954	1.054	1.092	1.276
24		0.211	0.308	0.327	0.494	0.543	1.088	1.175	1.217	1.422
26			0.361	0.383	0.568	0.624	1.206	1.301	1.348	1.576
28			0.419	0.444	0.646	0.709	1.330	1.435	1.487	1.737
30			0.547	0.580	0.729	0.801	1.459	1.575	1.632	1.906
32			0.618	0.655	0.817	0.898	1.595	1.721	1.783	2.084
34			0.693	0.735	0.911	1.000	1.737	1.874	1.942	2.269
36			0.772	0.819	1.009	1.109	1.884	2.033	2.107	2.462
38			0.855	0.907	1.112	1.222	2.038	2.199	2.279	2.663
40			0.943	1.000	1.221	1.341	2.198	2.372	2.457	2.871
42			1.035	1.097	1.334	1.466	2.364	2.551	2.643	3.088
44			1.131	1.199	1.453	1.596	2.536	2.736	2.835	3.313
46			1.231	1.306	1.576	1.732	2.714	2.928	3.034	3.545
48				1.417	1.705	1.873	2.898	3.127	3.239	3.785
50				1.533	1.839	2.020	3.088	3.332	3.452	4.033
52				1.653	1.977	2.173	3.284	3.543	3.671	4.289
54				1.778		2.331	3.486	3.761	3.897	4.553
56						2.494	3.694	3.986	4.129	4.825
58						2.663	3.908	4.217	4.369	5.105
60						2.838	4.128	4.454	4.615	5.392
62										
64										
66										
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHQB; H = TOTAL HEIGHT;
 B2 = 0.184 ; C1 = 0.691 ; C2 = 363.676

DATA SOURCE: 1169 TREES FROM N.B. QUE. CNT.
 ACCURACY: + OR - 16.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)
RED PINE / PINUS RESINOSA AIT.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002						
4	0.003	0.006	0.009	0.009						
6	0.007	0.014	0.020	0.021						
8	0.012	0.024	0.035	0.037	0.023	0.025	0.077	0.083	0.168	0.156
10	0.019	0.038	0.055	0.058	0.041	0.045	0.111	0.119	0.278	0.256
12	0.028	0.054	0.079	0.083	0.093	0.102	0.151	0.162	0.415	0.401
14	0.038	0.074	0.107	0.113	0.126	0.138	0.197	0.212	0.494	0.485
16	0.050	0.096	0.140	0.148	0.165	0.181	0.249	0.269	0.580	0.577
18		0.122	0.177	0.188	0.208	0.229	0.307	0.332	0.673	0.786
20		0.150	0.218	0.231	0.257	0.283	0.372	0.401	0.879	0.902
22		0.182	0.264	0.280	0.311	0.342	0.443	0.477	0.992	1.026
24		0.216	0.314	0.333	0.371	0.407	0.519	0.560	1.113	1.158
26			0.428	0.391	0.435	0.478	0.602	0.650	1.240	1.298
28			0.491	0.454	0.504	0.554	0.787	0.849	1.373	1.447
30			0.559	0.521	0.579	0.636	0.888	0.958	1.514	1.603
32			0.631	0.593	0.659	0.724	0.996	1.074	1.662	1.767
34			0.707	0.669	0.744	0.817	1.110	1.199	1.816	1.940
36			0.783	0.750	0.834	0.916	1.229	1.326	1.978	2.120
38			0.873	0.836	0.929	1.020	1.355	1.462	2.146	2.308
40			0.963	1.021	1.135	1.246	1.488	1.604	2.321	2.505
42			1.057	1.120	1.246	1.368	1.626	1.754	2.503	2.709
44			1.155	1.225	1.361	1.495	1.770	1.909	2.692	2.922
46			1.257	1.333	1.482	1.628	1.921	2.072	2.888	3.142
48				1.447	1.609	1.767	2.241	2.417	3.090	3.370
50				1.565	1.740	1.911	2.410	2.599	3.300	3.607
52				1.688	1.876	2.061	2.585	2.788	3.516	3.851
54				1.815	2.018	2.216	2.766	2.984	3.739	4.061
56						2.377	3.147	3.386	4.206	4.487
58						2.544	3.347	3.610	4.538	
60						2.716	3.553	3.832		
62						2.894	3.765	4.061		
64						2.854	4.208	4.538		
66										
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * C * (1 - 0.04365 * B^2) * H^2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.151; C1 = 0.710; C2 = 355.623

DATA SOURCE: 1333 TREES FROM N.B. QUE. CNT.
 ACCURACY: + OR - 17.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

JACK PINE / PINUS BANKSIANA LAMB.

DBH/CLASS (CM)	5	10	15	16	19	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.023	0.025	0.076	0.081	0.165	0.191
4	0.003	0.006	0.009	0.009	0.041	0.045	0.109	0.117	0.273	0.250
6	0.007	0.014	0.020	0.021	0.092	0.100	0.148	0.159	0.337	0.316
8	0.013	0.024	0.035	0.037	0.125	0.137	0.194	0.208	0.407	0.390
10	0.020	0.038	0.054	0.057	0.163	0.179	0.243	0.264	0.485	0.472
12	0.028	0.054	0.078	0.083	0.206	0.226	0.303	0.325	0.550	0.562
14	0.038	0.074	0.106	0.113	0.255	0.279	0.366	0.394	0.660	0.660
16	0.050	0.096	0.139	0.147	0.308	0.338	0.436	0.469	0.757	0.765
18		0.122	0.176	0.186	0.367	0.402	0.511	0.550	0.862	0.878
20		0.150	0.217	0.230	0.431	0.472	0.597	0.638	0.973	0.999
22		0.182	0.263	0.278	0.499	0.547	0.681	0.732	1.091	1.128
24		0.217	0.313	0.331	0.573	0.628	0.775	0.833	1.215	1.265
26			0.367	0.389	0.652	0.714	0.874	0.941	1.347	1.409
28			0.426	0.451	0.736	0.806	0.980	1.055	1.485	1.562
30			0.489	0.517	0.826	0.904	1.092	1.175	1.629	1.722
32			0.556	0.589	0.920	1.007	1.210	1.302	1.781	1.889
34			0.628	0.664	1.019	1.116	1.334	1.435	1.939	2.065
36			0.704	0.745	1.124	1.231	1.465	1.575	2.104	2.249
38			0.784	0.830	1.233	1.351	1.601	1.722	2.276	2.440
40			0.869	0.920	1.348	1.476	1.743	1.875	2.454	2.639
42			0.958	1.014	1.468	1.607	1.891	2.034	2.639	2.846
44			1.051	1.113	1.593	1.744	2.046	2.197	2.831	3.061
46			1.145	1.216	1.723	1.886	2.206	2.352	3.030	3.283
48			1.251	1.327	1.858	2.034	2.372	2.522	3.235	3.514
50				1.437	1.998	2.188	2.545	2.737	3.447	3.752
52				1.554		2.347	2.723	2.929	3.666	4.025
54				1.676		2.512	2.908	3.128	3.892	4.251
56				1.802		2.682	3.099	3.333	4.124	4.478
58						2.858	3.295	3.544	4.363	4.782
60							3.498	3.762	4.609	5.059
62							3.707	3.987		
64							3.922	4.218		
66							4.143	4.456		
68										
70										
72										
74										

EQUATION: $V = (C_0 \cdot 0.043651 \cdot D \cdot D^2 \cdot (1 - 0.04365 \cdot B^2) \cdot C_2) / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBH/CM; $H =$ TOTAL HEIGHT;
 $B^2 = 0.151$; $C_1 = 0.897$; $C_2 = 348.530$
 DATA SOURCE: 6166 TREES FROM QUEBEC, ONT., MAN., SASK.
 ACCURACY: ± CR - 15.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TOP INCLUDED)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.024	0.026	0.080	0.086	0.174	0.203
4	0.003	0.006	0.009	0.010	0.043	0.047	0.115	0.124	0.228	0.266
6	0.007	0.014	0.020	0.022	0.067	0.073	0.156	0.168	0.228	0.336
8	0.013	0.025	0.036	0.038	0.096	0.105	0.204	0.220	0.278	0.415
10	0.020	0.039	0.057	0.060	0.131	0.143	0.258	0.343	0.450	0.502
12	0.029	0.056	0.081	0.086	0.171	0.187	0.318	0.415	0.512	0.597
14	0.039	0.076	0.111	0.118	0.216	0.237	0.385	0.494	0.601	0.701
16	0.051	0.100	0.146	0.153	0.267	0.293	0.458	0.580	0.697	0.813
18	0.126	0.155	0.183	0.194	0.323	0.354	0.538	0.672	0.800	0.934
20	0.155	0.188	0.226	0.240	0.384	0.422	0.624	0.772	0.910	1.062
22	0.188	0.224	0.274	0.290	0.451	0.495	0.716	0.879	1.028	1.199
24	0.224	0.282	0.326	0.345	0.523	0.574	0.815	0.992	1.152	1.344
26			0.443	0.470	0.600	0.659	0.920	1.112	1.284	1.498
28			0.509	0.540	0.683	0.749	1.031	1.373	1.422	1.660
30			0.579	0.614	0.771	0.846	1.149	1.514	1.568	1.830
32			0.654	0.693	0.864	0.949	1.273	1.662	1.721	2.008
34			0.733	0.777	0.962	1.057	1.404	1.816	1.881	2.195
36			0.817	0.866	1.066	1.171	1.541	1.977	2.048	2.390
38			0.905	0.959	1.176	1.291	1.684	2.146	2.222	2.593
40			0.998	1.058	1.290	1.417	1.834	2.321	2.404	2.805
42			1.095	1.161	1.366	1.509	1.990	2.503	2.592	3.025
44			1.197	1.269	1.454	1.606	2.152	2.691	2.788	3.253
46			1.303	1.381	1.536	1.686	2.295	2.887	2.990	3.489
48				1.499	1.666	1.830	2.462	3.090	3.200	3.734
50				1.621	1.802	1.979	2.635	3.299	3.417	3.987
52				1.748	1.944	2.134	2.814	3.515	3.641	4.249
54				1.880	2.090	2.295	3.059	3.739	3.872	4.518
56						2.462	3.260	3.969	4.110	4.796
58						2.635	3.467	4.205	4.356	5.083
60						2.814	3.680	4.449	4.608	5.377
62						2.998	3.900	4.700	4.868	5.680
64							4.126			
66							4.358			
68										
70										
72										
74										

EQUATION: $V = (C_1 \cdot 0.04365 \cdot D^3 \cdot H) - 0.04365 \cdot B^2 \cdot H^2 / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.118 ; C1 = 0.694 ; C2 = 343.896

DATA SOURCE: 850 TREES FROM ALTA.
 ACCURACY: ± OR - 15.2 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TCP INCLUDED)
 BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

CBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.022	0.023	0.070	0.074	0.150	0.170
4	0.003	0.006	0.008	0.009	0.038	0.042	0.100	0.107	0.196	0.223
6	0.007	0.013	0.019	0.020	0.060	0.065	0.137	0.146	0.248	0.282
8	0.020	0.037	0.052	0.054	0.117	0.123	0.178	0.190	0.306	0.348
10	0.028	0.053	0.075	0.078	0.153	0.166	0.226	0.241	0.370	0.421
12	0.039	0.072	0.101	0.107	0.194	0.210	0.279	0.297	0.441	0.501
14	0.051	0.094	0.132	0.140	0.239	0.260	0.337	0.360	0.517	0.588
16		0.119	0.168	0.177	0.290	0.314	0.402	0.428	0.600	0.682
18		0.147	0.207	0.218	0.345	0.374	0.471	0.502	0.689	0.783
20		0.178	0.250	0.264	0.404	0.439	0.547	0.583	0.885	1.005
22		0.212	0.298	0.314	0.469	0.509	0.627	0.669	0.992	1.127
24			0.350	0.368	0.538	0.584	0.714	0.761	1.105	1.256
26			0.406	0.427	0.613	0.664	0.806	0.859	1.225	1.391
28			0.456	0.490	0.691	0.750	0.903	0.963	1.350	1.534
30			0.530	0.558	0.775	0.841	1.007	1.073	1.482	1.684
32			0.598	0.630	0.864	0.937	1.115	1.189	1.620	1.840
34			0.671	0.706	0.957	1.038	1.230	1.311	1.764	2.004
36			0.747	0.787	1.055	1.144	1.350	1.439	1.914	2.174
38			0.828	0.872	1.153	1.256	1.475	1.573	2.070	2.352
40			0.872	0.917	1.256	1.373	1.606	1.712	2.232	2.536
42			0.913	0.961	1.362	1.495	1.743	1.858	2.400	2.727
44			1.002	1.055	1.474	1.617	1.885	2.010	2.575	2.925
46			1.092	1.153	1.589	1.744	2.033	2.167	2.756	3.131
48			1.192	1.256	1.709	1.876	2.186	2.331	2.942	3.343
50				1.362			2.345	2.500	3.135	3.562
52				1.474			2.509	2.675	3.334	3.788
54				1.589			2.680	2.857	3.539	4.021
56				1.709			2.855	3.044	3.968	4.508
58							3.036	3.237	4.191	
60							3.223	3.436		
62							3.416	3.641		
64							3.614	3.853		
66							3.817	4.070		
68										
70										
72										
74										

EQUATION: $V = (0.003891 * D * D * (1 - 0.04365 * B2) * 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.164; C1 = 1.588; C2 = 333.364

DATA SOURCE: 7442 TREES FROM NFLD., N.B., QUE., CNT., MAN., SASK.
 ACCURACY: ± OR - 17.0 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TCP INCLUDED)
 RED SPRUCE / PICEA RUBENS SARG.

DBHOB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.024	0.026	0.077	0.083	0.167	0.191
4	0.003	0.006	0.009	0.010	0.042	0.046	0.111	0.119	0.218	0.250
6	0.008	0.014	0.020	0.021	0.066	0.072	0.151	0.162	0.276	0.316
8	0.014	0.026	0.036	0.038	0.095	0.103	0.198	0.211	0.341	0.390
10	0.021	0.040	0.057	0.060	0.095	0.103	0.374	0.400	0.412	0.472
12	0.030	0.057	0.081	0.086	0.129	0.140	0.445	0.476	0.491	0.562
14	0.041	0.078	0.111	0.117	0.168	0.183	0.522	0.558	0.576	0.659
16	0.054	0.102	0.145	0.153	0.213	0.232	0.605	0.647	0.668	0.765
18	0.129	0.129	0.183	0.193	0.263	0.286	0.695	0.743	0.767	0.878
20	0.159	0.239	0.226	0.239	0.318	0.347	0.791	0.846	0.872	0.999
22	0.193	0.289	0.274	0.289	0.379	0.412	0.892	0.955	0.985	1.127
24	0.230	0.344	0.326	0.344	0.445	0.484	1.001	1.070	1.104	1.264
26		0.404	0.382	0.404	0.516	0.561	1.115	1.192	1.230	1.408
28		0.444	0.444	0.468	0.592	0.644	1.235	1.321	1.363	1.560
30		0.509	0.509	0.537	0.674	0.733	1.362	1.457	1.503	1.720
32		0.579	0.654	0.611	0.760	0.828	1.495	1.599	1.649	1.888
34		0.654	0.690	0.690	0.853	0.928	1.634	1.747	1.803	2.063
36		0.733	0.774	0.774	0.953	1.024	1.779	1.903	1.963	2.247
38		0.817	0.862	0.862	1.053	1.146	1.930	2.064	2.130	2.438
40		0.905	0.955	0.955	1.160	1.263	2.088	2.233	2.303	2.637
42		0.998	1.053	1.053	1.274	1.386	2.251	2.408	2.484	2.843
44		1.095	1.156	1.156	1.392	1.515	2.421	2.590	2.671	3.058
46		1.197	1.263	1.263	1.516	1.650	2.597	2.778	2.866	3.280
48		1.304	1.376	1.376	1.645	1.790	2.779	2.973	3.067	3.510
50			1.493	1.493	1.779	1.936	2.968	3.174	3.278	3.748
52			1.615	1.615	1.918	2.088	3.162	3.382	3.489	3.994
54			1.741	1.741	2.063	2.246	3.363	3.597	3.711	4.248
56			1.873	1.873	2.063	2.246	3.570	3.818	3.939	4.509
58						2.409	3.783	4.046	4.174	4.778
60						2.578	4.002	4.281	4.416	5.055
62						2.753	4.228	4.522	4.665	5.340
64						2.933				
66										
68										
70										
72										
74										

EQUATION: $V = (C \cdot 0.043891 \cdot D \cdot D \cdot (1 - 0.04365 \cdot B^2)) \cdot H^2 / (C1 + 0.3048 \cdot C2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBHOB; $H =$ TOTAL HEIGHT;
 $B^2 = C \cdot 169$; $C1 = 1.226$; $C2 = 315.832$

DATA SOURCE: 227 TREES FROM N.B.
 ACCURACY: ± OR - 13.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TOP INCLUDED)
 WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.022	0.023	0.070	0.075	0.151	0.172
4	0.003	0.006	0.008	0.009	0.038	0.042	0.101	0.108	0.197	0.225
6	0.007	0.013	0.019	0.020	0.066	0.065	0.137	0.146	0.250	0.285
8	0.012	0.023	0.033	0.035	0.086	0.094	0.179	0.191	0.308	0.352
10	0.019	0.036	0.051	0.054	0.117	0.127	0.227	0.242	0.373	0.425
12	0.028	0.052	0.074	0.078	0.153	0.166	0.280	0.299	0.444	0.505
14	0.038	0.071	0.101	0.106	0.194	0.210	0.338	0.362	0.521	0.594
16	0.050	0.093	0.132	0.139	0.239	0.260	0.403	0.430	0.604	0.689
18		0.118	0.167	0.176	0.289	0.314	0.473	0.505	0.693	0.791
20		0.146	0.206	0.217	0.344	0.374	0.548	0.586	0.789	0.900
22		0.176	0.249	0.263	0.404	0.439	0.629	0.672	0.864	0.998
24		0.210	0.297	0.313	0.468	0.509	0.716	0.765	0.968	1.139
26			0.348	0.367	0.538	0.585	0.808	0.864	1.112	1.269
28			0.404	0.426	0.612	0.665	0.906	0.968	1.232	1.407
30			0.463	0.489	0.691	0.751	1.010	1.079	1.359	1.551
32			0.527	0.556	0.774	0.842	1.119	1.195	1.491	1.702
34			0.595	0.628	0.863	0.938	1.233	1.318	1.630	1.860
36			0.667	0.704	0.956	1.039	1.354	1.446	1.774	2.025
38			0.744	0.784	1.054	1.146	1.480	1.581	1.925	2.193
40			0.824	0.869	1.157	1.257	1.611	1.721	2.082	2.377
42			0.908	0.958	1.264	1.374	1.748	1.868	2.246	2.563
44			0.997	1.051	1.376	1.496	1.891	2.020	2.415	2.757
46			1.090	1.149	1.494	1.624	2.039	2.178	2.591	2.957
48			1.186	1.251	1.615	1.756	2.185	2.343	2.773	3.165
50				1.358	1.742	1.894	2.352	2.513	2.960	3.379
52				1.468	1.874	2.037	2.517	2.689	3.155	3.601
54				1.584		2.185	2.688	3.060	3.555	4.065
56				1.703		2.338	2.864	3.254	3.774	4.307
58						2.456	3.046	3.454	3.992	4.557
60						2.660	3.233	3.660	4.217	4.814
62							3.426	3.872		
64							3.625	4.091		
66							3.829			
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B^2)) * H^2 / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBH@B; H = TOTAL HEIGHT;
 B2 = 0.176; C1 = 1.440; C2 = 342.175

DATA SOURCE: 2692 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.
 ACCURACY: ± OR - 17.9 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)
BALSAM FIR / ABIES BALSAMEA (L.) MILL.

CBHOE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.022	0.023	0.069	0.073	0.146	0.163
4	0.003	0.006	0.008	0.009	0.038	0.041	0.099	0.104	0.191	0.213
6	0.014	0.024	0.019	0.020	0.060	0.064	0.134	0.142	0.241	0.270
8	0.021	0.038	0.034	0.035	0.086	0.093	0.175	0.186	0.298	0.333
10	0.030	0.055	0.052	0.055	0.117	0.126	0.222	0.235	0.360	0.403
12	0.041	0.075	0.076	0.079	0.153	0.165	0.274	0.290	0.429	0.479
14	0.054	0.098	0.103	0.108	0.194	0.208	0.332	0.351	0.503	0.563
16		0.124	0.134	0.141	0.239	0.257	0.395	0.418	0.584	0.653
18		0.153	0.170	0.178	0.289	0.311	0.463	0.490	0.670	0.749
20		0.185	0.210	0.254	0.266	0.370	0.537	0.569	0.762	0.852
22		0.185	0.302	0.354	0.316	0.435	0.617	0.653	0.861	0.962
24		0.220	0.371	0.411	0.431	0.504	0.702	0.743	0.940	1.070
26			0.471	0.536	0.538	0.579	0.888	0.940	1.075	1.202
28			0.606	0.635	0.691	0.743	0.928	1.048	1.191	1.332
30			0.679	0.712	0.775	0.833	1.097	1.161	1.313	1.468
32			0.756	0.793	0.863	0.928	1.209	1.280	1.442	1.611
34			0.838	0.879	0.956	1.029	1.327	1.405	1.576	1.761
36			0.924	0.969	1.054	1.134	1.451	1.535	1.716	1.918
38			1.014	1.063	1.157	1.245	1.579	1.672	1.862	2.081
40			1.108	1.162	1.265	1.361	1.714	1.814	2.013	2.251
42			1.207	1.266	1.377	1.481	1.854	1.962	2.171	2.427
44				1.373	1.494	1.607	1.999	2.116	2.335	2.610
46				1.485	1.616	1.739	2.150	2.275	2.505	2.800
48				1.602	1.743	1.875	2.306	2.441	2.681	2.996
50				1.723	1.874	2.016	2.468	2.612	2.862	3.199
52						2.163	2.635	2.789	3.050	3.409
54						2.315	2.808	2.972	3.244	3.626
56						2.472	2.986	3.160	3.443	3.849
58						2.634	3.170	3.355	3.649	4.078
60							3.359	3.555	3.860	4.315
62							3.554	3.761	4.077	4.558
64							3.754	3.973		

EQUATION: $V = (C_0 \cdot 0.043891 \cdot D \cdot D^2 \cdot (1 - 0.04365 \cdot B^2) \cdot H^2) / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBH; $H =$ TOTAL HEIGHT;
 $B^2 = 0.152$; $C_1 = 2.139$; $C_2 = 301.634$

DATA SOURCE: 2768 TREES FROM NFD, N.B., QUE., MAN., SASK.
 ACCURACY: ± OR - 17.8 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

EASTERN WHITE CEDAR / THUJA OCCIDENTALIS L.

DBH@B CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.019	0.020	0.057	0.059	0.119	0.128
4	0.004	0.006	0.008	0.008	0.033	0.035	0.082	0.086	0.155	0.167
6	0.008	0.013	0.017	0.018	0.052	0.055	0.112	0.117	0.196	0.211
8	0.015	0.024	0.030	0.031	0.075	0.079	0.147	0.152	0.242	0.260
10	0.023	0.037	0.047	0.049	0.102	0.107	0.186	0.193	0.293	0.315
12	0.033	0.054	0.068	0.071	0.133	0.140	0.229	0.238	0.349	0.375
14	0.044	0.073	0.093	0.096	0.169	0.178	0.277	0.283	0.409	0.440
16	0.058	0.095	0.121	0.125	0.252	0.265	0.330	0.343	0.475	0.510
18	0.121	0.149	0.153	0.159	0.300	0.316	0.387	0.402	0.545	0.585
20	0.149	0.180	0.189	0.196	0.352	0.371	0.445	0.466	0.620	0.666
22	0.214	0.214	0.229	0.237	0.408	0.430	0.515	0.535	0.700	0.752
24			0.273	0.282	0.469	0.493	0.586	0.609	0.785	0.843
26			0.320	0.331	0.533	0.561	0.662	0.688	0.874	0.939
28			0.371	0.384	0.602	0.634	0.742	0.771	0.969	1.041
30			0.426	0.441	0.675	0.710	0.827	0.859	1.068	1.148
32			0.485	0.502	0.752	0.792	0.916	0.952	1.172	1.260
34			0.547	0.567	0.833	0.877	1.010	1.050	1.281	1.377
36			0.614	0.635	0.919	0.967	1.109	1.159	1.395	1.499
38			0.684	0.708	1.008	1.061	1.212	1.271	1.513	1.627
40			0.758	0.784	1.102	1.160	1.320	1.387	1.637	1.759
42			0.835	0.865	1.200	1.263	1.432	1.509	1.765	1.898
44			0.917	0.949	1.302	1.370	1.549	1.635	1.898	2.040
46			1.002	1.037	1.408	1.482	1.670	1.765	2.036	2.189
48			1.091	1.129	1.519	1.598	1.796	1.898	2.179	2.342
50				1.226	1.633	1.719	1.927	2.002	2.327	2.501
52				1.326	1.408	1.844	2.062	2.142	2.479	2.665
54				1.430	1.519	1.973	2.202	2.287	2.637	2.834
56				1.537	1.633	2.107	2.346	2.437	2.799	3.008
58					1.633	2.245	2.495	2.592	2.966	3.188
60							2.648	2.751	3.138	3.373
62							2.969	3.084	3.315	3.563
64							3.136	3.258		
66										
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBH@B; $H =$ TOTAL HEIGHT;
 $B2 = 0.155$; $C1 = 4.167$; $C2 = 244.906$

DATA SOURCE: 187 TREES FROM QUE., CNT.
 ACCURACY: ± OR - 16.4 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

EASTERN HEMLOCK / TSUGA CANADENSIS (L.) CARR.

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.022	0.024	0.073	0.078	0.158	0.182
4	0.003	0.006	0.008	0.009	0.039	0.043	0.105	0.112	0.206	0.237
6	0.007	0.013	0.019	0.020	0.062	0.067	0.142	0.153	0.261	0.300
8	0.012	0.024	0.034	0.036	0.089	0.097	0.186	0.199	0.322	0.371
10	0.019	0.037	0.053	0.056	0.121	0.132	0.235	0.252	0.390	0.449
12	0.028	0.053	0.076	0.080	0.157	0.172	0.290	0.312	0.464	0.534
14	0.038	0.072	0.103	0.109	0.218	0.218	0.351	0.377	0.544	0.627
16	0.049	0.094	0.135	0.142	0.246	0.269	0.418	0.449	0.631	0.727
18	0.071	0.119	0.171	0.180	0.258	0.289	0.491	0.527	0.724	0.835
20	0.101	0.147	0.211	0.223	0.314	0.325	0.569	0.611	0.824	0.950
22	0.131	0.178	0.255	0.269	0.376	0.387	0.654	0.701	0.930	1.072
24	0.161	0.212	0.303	0.321	0.416	0.454	0.744	0.798	1.043	1.202
26	0.191	0.251	0.356	0.376	0.482	0.527	0.839	0.901	1.162	1.339
28	0.221	0.291	0.413	0.436	0.554	0.604	0.941	1.010	1.288	1.484
30	0.251	0.331	0.474	0.501	0.630	0.688	1.049	1.125	1.420	1.636
32	0.281	0.371	0.539	0.570	0.711	0.776	1.162	1.246	1.558	1.795
34	0.311	0.411	0.608	0.643	0.797	0.870	1.281	1.374	1.703	1.962
36	0.341	0.451	0.682	0.721	0.888	0.970	1.406	1.508	1.854	2.137
38	0.371	0.491	0.760	0.804	0.984	1.075	1.537	1.648	2.012	2.318
40	0.401	0.531	0.842	0.890	1.085	1.185	1.673	1.795	2.176	2.508
42	0.431	0.571	0.929	0.982	1.191	1.300	1.816	1.948	2.347	2.704
44	0.461	0.611	1.019	1.077	1.301	1.421	1.964	2.106	2.524	2.908
46	0.491	0.651	1.114	1.177	1.417	1.547	2.118	2.277	2.707	3.120
48	0.521	0.691	1.213	1.282	1.538	1.679	2.243	2.443	2.897	3.339
50	0.551	0.731	1.313	1.391	1.663	1.816	2.372	2.621	3.094	3.565
52	0.581	0.771	1.413	1.505	1.753	1.958	2.497	2.795	3.296	3.799
54	0.611	0.811	1.513	1.623	1.843	2.118	2.621	2.995	3.506	4.040
56	0.641	0.851	1.613	1.745	1.929	2.186	2.743	3.193	3.721	4.288
58	0.671	0.891	1.713	1.875	2.016	2.259	2.866	3.393	3.943	4.544
60	0.701	0.931	1.813	1.997	2.106	2.339	2.990	3.602	4.166	4.808
62	0.731	0.971	1.913	2.119	2.196	2.418	3.115	3.817	4.389	4.808
64	0.761	1.011	2.013	2.241	2.286	2.502	3.240	4.038	4.612	5.078
66	0.791	1.051	2.113	2.363	2.376	2.582	3.363	4.266	4.835	5.078
68	0.821	1.091	2.213	2.485	2.466	2.666	3.486	4.489	5.060	5.078
70	0.851	1.131	2.313	2.607	2.550	2.750	3.608	4.712	5.283	5.078
72	0.881	1.171	2.413	2.729	2.634	2.834	3.730	4.935	5.506	5.078
74	0.911	1.211	2.513	2.851	2.718	2.918	3.852	5.158	5.729	5.078

EQUATION: $V = (C_1 \cdot 0.043891 \cdot D \cdot H^2) / (1 - 0.04365 \cdot B^2) \cdot H^2$; $C_1 = 0.3048 \cdot C_2 / H$
 WHERE: V = TOTAL VOLUME; D = DBH@B; H = TOTAL HEIGHT;
 B2 = 0.155 ; C1 = 1.112 ; C2 = 350.092

DATA SOURCE: 383 TREES FROM ONT.
 ACCURACY: ± OR - 23.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

TREMBLING ASPEN / POPULUS TREMULOIDES MICHX.

DBH/D CLASS (CM)	5	10	15	16	18	20	22	24	25	30
	TOTAL HEIGHT (M)									
2	0.001									
4	0.003									
6	0.006									
8	0.011									
10	0.016	0.001	0.002	0.002	0.022	0.025	0.076	0.083	0.170	0.206
12	0.024	0.005	0.008	0.009	0.039	0.044	0.109	0.119	0.222	0.269
14	0.032	0.012	0.018	0.020	0.061	0.068	0.148	0.163	0.281	0.341
16	0.042	0.021	0.032	0.035	0.088	0.099	0.194	0.212	0.346	0.421
18		0.033	0.051	0.054	0.120	0.134	0.245	0.269	0.419	0.509
20		0.048	0.073	0.078	0.157	0.175	0.303	0.332	0.499	0.606
22		0.065	0.099	0.106	0.195	0.222	0.366	0.401	0.585	0.711
24		0.085	0.130	0.139	0.245	0.274	0.436	0.478	0.679	0.825
26		0.108	0.164	0.176	0.297	0.331	0.511	0.561	0.779	0.947
28		0.134	0.203	0.217	0.353	0.394	0.593	0.650	0.887	1.078
30		0.162	0.245	0.262	0.414	0.463	0.681	0.746	1.001	1.217
32		0.192	0.292	0.312	0.480	0.536	0.775	0.849	1.122	1.364
34		0.243	0.343	0.366	0.528	0.616	0.874	0.959	1.251	1.520
36		0.297	0.425	0.425	0.628	0.701	0.980	1.075	1.386	1.684
38		0.356	0.488	0.488	0.652	0.751	1.092	1.198	1.528	1.856
40		0.419	0.555	0.555	0.708	0.791	1.120	1.227	1.606	1.937
42		0.482	0.627	0.627	0.794	0.887	1.210	1.327	1.677	2.037
44		0.545	0.703	0.703	0.885	0.988	1.334	1.463	1.833	2.227
46		0.608	0.783	0.783	0.981	1.095	1.464	1.606	1.995	2.425
48		0.671	0.867	0.867	1.086	1.207	1.601	1.755	2.165	2.631
50		0.734	0.956	0.956	1.186	1.325	1.743	1.911	2.342	2.846
52		0.797	1.050	1.050	1.297	1.448	1.891	2.073	2.525	3.069
54		0.860	1.147	1.147	1.412	1.577	2.045	2.242	2.716	3.300
56		0.923	1.245	1.245	1.532	1.711	2.206	2.418	2.913	3.540
58		0.986	1.355	1.355	1.657	1.850	2.372	2.601	3.118	3.788
60		1.049	1.466	1.466	1.787	1.995	2.545	2.790	3.329	4.045
62		1.112	1.581	1.581	1.922	2.146	2.723	2.986	3.547	4.310
64		1.175	1.700	1.700	2.055	2.280	2.908	3.188	3.772	4.584
66		1.238	1.829	1.829	2.174	2.419	3.098	3.397	4.005	4.866
68		1.301	1.958	1.958	2.293	2.554	3.295	3.613	4.244	5.156
70		1.364	2.087	2.087	2.412	2.723	3.498	3.835	4.485	5.455
72		1.427	2.216	2.216	2.531	2.854	3.707	4.064	4.742	5.763
74		1.490	2.345	2.345	2.650	3.025	3.921	4.299		

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.127; C1 = -0.312; C2 = 436.683
 DATA SOURCE: 800 TREES FROM QUE., CNT., MAN., SASK.
 ACCURACY: + OR - 17.9 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TOP INCLUDED)

BALSAM POPLAR / POPULUS BALSAMIFERA L.

CBH/D CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.022	0.024	0.074	0.080	0.163	0.192
4	0.003	0.006	0.008	0.009	0.039	0.043	0.106	0.115	0.212	0.251
6	0.006	0.013	0.019	0.020	0.088	0.097	0.132	0.157	0.269	0.317
8	0.011	0.022	0.033	0.035	0.129	0.132	0.189	0.205	0.332	0.392
10	0.018	0.035	0.051	0.055	0.156	0.173	0.239	0.259	0.402	0.474
12	0.026	0.050	0.074	0.079	0.198	0.219	0.295	0.320	0.478	0.564
14	0.035	0.068	0.101	0.107	0.244	0.270	0.357	0.460	0.650	0.768
16	0.045	0.089	0.132	0.140	0.296	0.327	0.425	0.540	0.747	0.882
18		0.113	0.167	0.177	0.348	0.456	0.498	0.626	0.850	1.003
20		0.139	0.206	0.219	0.479	0.529	0.578	0.719	0.959	1.133
22		0.169	0.249	0.265	0.550	0.607	0.664	0.818	1.075	1.270
24		0.201	0.296	0.315	0.626	0.691	0.755	0.924	1.198	1.415
26			0.348	0.370	0.706	0.780	0.852	1.036	1.328	1.568
28			0.403	0.429	0.882	0.874	0.955	1.154	1.464	1.729
30			0.463	0.492	0.978	0.974	1.065	1.279	1.606	1.897
32			0.527	0.560	1.079	1.079	1.180	1.410	1.756	2.073
34			0.595	0.632	1.183	1.190	1.300	1.547	1.912	2.258
36			0.667	0.709	1.293	1.306	1.427	1.691	2.074	2.450
38			0.743	0.790	1.408	1.427	1.560	1.841	2.244	2.650
40			0.823	0.875	1.528	1.554	1.699	2.030	2.419	2.857
42			0.907	0.965	1.652	1.686	1.843	2.216	2.602	3.073
44			0.996	1.059	1.782	1.824	1.993	2.419	2.791	3.296
46			1.088	1.157	1.916	1.967	2.150	2.602	2.987	3.528
48			1.185	1.260	2.051	2.116	2.312	2.791	3.189	3.767
50				1.367	2.196	2.269	2.480	2.987	3.398	4.014
52				1.479	2.333	2.429	2.654	3.072	3.481	4.268
54				1.595	2.473	2.593	2.834	3.273	3.614	4.531
56				1.715	2.617	2.763	3.020	3.481	3.837	4.802
58					2.763		3.211	3.695	4.066	5.080
60							3.409	3.915	4.301	5.366
62							3.522	4.142	4.543	
64							3.644			
66							3.763			
68							3.882			
70							4.003			
72							4.122			
74							4.244			

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBHCB; $H =$ TOTAL HEIGHT;
 $B2 = 0.127$; $C1 = 0.420$; $C2 = 394.644$

DATA SOURCE: 2421 TREES FROM ONT.
 ACCURACY: + OR - 18.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

WHITE BIRCH / BETULA PAPIRIFERA MARSH.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001									0.161
4	0.003	0.002	0.002	0.002	0.021	0.023	0.068	0.072	0.144	0.210
6	0.008	0.006	0.008	0.009	0.038	0.041	0.059	0.097	0.188	0.266
8	0.013	0.024	0.033	0.035	0.055	0.064	0.085	0.103	0.238	0.328
10	0.021	0.038	0.052	0.054	0.078	0.092	0.116	0.140	0.294	0.397
12	0.030	0.055	0.075	0.078	0.107	0.125	0.133	0.148	0.355	0.472
14	0.041	0.074	0.102	0.107	0.151	0.163	0.173	0.183	0.423	0.554
16	0.054	0.097	0.133	0.139	0.192	0.206	0.219	0.232	0.576	0.738
18		0.123	0.168	0.176	0.237	0.254	0.271	0.286	0.661	0.839
20		0.152	0.208	0.218	0.286	0.308	0.328	0.347	0.752	0.947
22		0.184	0.251	0.263	0.341	0.366	0.390	0.412	0.849	1.062
24		0.219	0.299	0.313	0.400	0.430	0.458	0.484	0.952	1.183
26			0.351	0.368	0.464	0.498	0.531	0.561	1.034	1.311
28			0.407	0.427	0.532	0.572	0.609	0.644	1.175	1.446
30			0.467	0.490	0.606	0.651	0.693	0.733	1.263	1.587
32			0.532	0.557	0.684	0.735	0.783	0.828	1.386	1.734
34			0.600	0.629	0.766	0.824	0.877	0.928	1.515	1.888
36			0.673	0.705	0.854	0.918	0.978	1.034	1.692	2.049
38			0.750	0.786	0.946	1.017	1.083	1.145	1.836	2.216
40			0.831	0.870	1.046	1.121	1.183	1.245	1.932	2.390
42			0.916	0.960	1.145	1.231	1.311	1.386	2.048	2.570
44			1.005	1.053	1.251	1.345	1.433	1.515	2.175	2.757
46			1.098	1.151	1.363	1.464	1.560	1.650	2.303	2.950
48			1.196	1.253	1.478	1.589	1.693	1.790	2.444	3.150
50				1.360	1.599	1.719	1.831	1.936	2.609	3.357
52				1.471	1.724	1.853	1.974	2.088	2.823	3.570
54				1.586	1.855	1.993	2.123	2.245	3.009	3.789
56				1.706	1.855	2.138	2.278	2.408	3.199	4.016
58					1.855	2.288	2.437	2.577	3.396	4.248
60					2.043	2.443	2.603	2.752	3.608	4.488
62					2.260	2.603	2.773	2.932	3.808	
64					2.603	2.949	3.119	3.288	4.022	
66					3.131	3.318	3.508	3.696		
68					3.518	3.711	3.920			
70					3.920					
72										
74										

EQUATION: $V = (C_0 \cdot C_1 \cdot D^2 \cdot H) \cdot (1 - 0.04365 \cdot B^2) \cdot C_2$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.176; C1 = 2.222; C2 = 300.373

DATA SOURCE: 1272 TREES FROM QUE. ONT., ALTA.
 ACCURACY: + OR - 22.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TOP INCLUDED)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.021	0.023	0.069	0.074	0.150	0.171
4	0.003	0.008	0.008	0.009	0.038	0.126	0.100	0.107	0.196	0.223
6	0.007	0.018	0.018	0.019	0.059	0.165	0.136	0.145	0.248	0.283
8	0.012	0.033	0.033	0.034	0.085	0.209	0.178	0.240	0.306	0.349
10	0.019	0.051	0.051	0.054	0.116	0.258	0.225	0.297	0.370	0.422
12	0.028	0.074	0.074	0.078	0.152	0.312	0.336	0.359	0.440	0.503
14	0.038	0.100	0.100	0.106	0.192	0.371	0.400	0.427	0.517	0.590
16	0.049	0.131	0.131	0.138	0.237	0.436	0.469	0.501	0.599	0.684
18		0.166	0.166	0.175	0.287	0.580	0.625	0.667	0.688	0.785
20		0.117	0.204	0.216	0.341	0.745	0.711	0.759	0.783	0.853
22		0.145	0.247	0.261	0.401	0.802	0.802	0.857	0.884	1.009
24		0.175	0.294	0.310	0.465	0.835	0.899	0.961	0.991	1.131
26		0.208	0.345	0.364	0.534	0.931	1.002	1.070	1.104	1.260
28			0.401	0.422	0.607	1.031	1.110	1.186	1.223	1.396
30			0.460	0.485	0.685	1.137	1.224	1.308	1.348	1.539
32			0.523	0.552	0.768	1.248	1.343	1.435	1.480	1.689
34			0.591	0.623	0.856	1.364	1.468	1.569	1.617	1.846
36			0.662	0.698	0.949	1.485	1.599	1.708	1.761	2.010
38			0.738	0.778	1.046	1.611	1.735	1.853	1.911	2.181
40			0.818	0.862	1.148	1.743	1.876	2.005	2.067	2.359
42			0.901	0.951	1.254	1.879	2.024	2.162	2.229	2.544
44			0.989	1.043	1.366	2.021	2.176	2.325	2.397	2.735
46			1.081	1.140	1.482	2.168	2.334	2.494	2.571	2.935
48			1.177	1.242	1.603	2.320	2.498	2.659	2.751	3.141
50				1.347	1.729	2.477	2.667	2.850	2.938	3.354
52				1.457	1.859	2.640	2.842	3.036	3.131	3.573
54				1.571			3.023	3.229	3.329	3.800
56				1.690			3.209	3.428	3.534	4.034
58							3.400	3.633	3.745	4.275
60							3.597	3.843	3.962	4.523
62							3.800	4.060	4.185	4.777
64										
66										
68										
70										
72										
74										

EQUATION: $V = (C_0 \cdot 0.043891 \cdot D \cdot D^2 \cdot (1 - 0.04365 \cdot B^2) \cdot H^2) / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBH@B; $H =$ TOTAL HEIGHT;
 $B^2 = 0.181$; $C_1 = 1.449$; $C_2 = 344.754$

DATA SOURCE: 1733 TREES FROM QUE., GNT.
 ACCURACY: + OR - 34.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TOP INCLUDED)

MAPLE / ACER L.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.021	0.023	0.068	0.073	0.148	0.172
4	0.003	0.005	0.008	0.008	0.037	0.040	0.098	0.105	0.245	0.284
6	0.006	0.012	0.018	0.019	0.057	0.063	0.133	0.143	0.303	0.350
8	0.011	0.022	0.031	0.033	0.083	0.090	0.174	0.187	0.366	0.424
10	0.018	0.034	0.049	0.052	0.113	0.123	0.272	0.293	0.436	0.505
12	0.026	0.049	0.071	0.075	0.147	0.161	0.330	0.354	0.512	0.592
14	0.035	0.067	0.096	0.102	0.186	0.204	0.392	0.421	0.681	0.788
16	0.045	0.087	0.125	0.133	0.230	0.251	0.460	0.495	0.775	0.897
18		0.110	0.159	0.168	0.278	0.304	0.534	0.574	0.875	1.013
20		0.136	0.196	0.207	0.331	0.362	0.613	0.659	0.981	1.135
22		0.165	0.237	0.251	0.350	0.425	0.697	0.749	1.097	1.265
24		0.196	0.282	0.299	0.388	0.453	0.782	0.848	1.211	1.402
26		0.231	0.331	0.350	0.450	0.565	0.882	0.948	1.335	1.545
28		0.267	0.384	0.406	0.517	0.643	0.983	1.057	1.465	1.696
30		0.304	0.441	0.467	0.588	0.726	1.089	1.171	1.601	1.854
32		0.341	0.481	0.509	0.644	0.814	1.201	1.291	1.743	2.018
34		0.381	0.522	0.559	0.707	0.907	1.318	1.417	1.892	2.190
36		0.421	0.566	0.599	0.748	0.970	1.441	1.548	2.046	2.369
38		0.461	0.606	0.643	0.829	1.005	1.569	1.686	2.206	2.554
40		0.502	0.648	0.672	0.829	1.005	1.702	1.829	2.373	2.747
42		0.544	0.684	0.707	0.829	1.005	1.841	1.979	2.545	2.947
44		0.588	0.724	0.748	0.829	1.005	1.985	2.134	2.724	3.154
46		0.635	0.764	0.784	0.829	1.005	2.135	2.295	2.909	3.367
48		0.677	0.804	0.829	0.829	1.005	2.290	2.462	3.099	3.588
50		0.721	0.844	0.864	0.829	1.005	2.451	2.634	3.296	3.816
52		0.766	0.884	0.904	0.829	1.005	2.617	2.813	3.496	4.051
54		0.811	0.924	0.944	0.829	1.005	2.788	2.997	3.708	4.292
56		0.856	0.964	0.984	0.829	1.005	2.966	3.187	3.923	4.541
58		0.901	1.004	1.024	0.829	1.005	3.148	3.384	4.143	4.797
60		0.946	1.044	1.064	0.829	1.005	3.336	3.586		
62		0.991	1.084	1.104	0.829	1.005	3.525	3.793		
64		1.036	1.124	1.144	0.829	1.005	3.728	4.007		
66		1.081	1.164	1.184	0.829	1.005				
68		1.126	1.204	1.224	0.829	1.005				
70		1.171	1.244	1.264	0.829	1.005				
72		1.216	1.284	1.304	0.829	1.005				
74		1.261	1.324	1.344	0.829	1.005				

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$

WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
B2 = 0.145; C1 = 1.046; C2 = 383.972

DATA SOURCE: 3967 TREES FROM ONT.
ACCURACY: + OR - 30.3 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

BASSWOOD / TILIA AMERICANA L.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.020	0.022	0.067	0.072		0.169
4	0.005	0.008	0.008	0.008	0.036	0.039	0.096	0.103		0.221
6	0.012	0.017	0.017	0.017	0.056	0.061	0.130	0.140		0.279
8	0.021	0.030	0.030	0.030	0.081	0.088	0.170	0.183		0.345
10	0.033	0.048	0.048	0.048	0.110	0.120	0.216	0.232	0.145	0.417
12	0.047	0.069	0.069	0.069	0.143	0.157	0.266	0.287	0.359	0.497
14	0.064	0.093	0.093	0.093	0.181	0.199	0.322	0.347	0.427	0.583
16	0.084	0.122	0.122	0.122	0.224	0.245	0.383	0.413	0.501	0.676
18	0.106	0.154	0.154	0.154	0.271	0.297	0.450	0.485	0.582	0.776
20	0.131	0.190	0.190	0.190	0.322	0.353	0.522	0.562	0.668	0.883
22	0.159	0.230	0.230	0.230	0.378	0.415	0.599	0.645	0.760	0.997
24	0.189	0.274	0.274	0.274	0.439	0.481	0.682	0.734	0.857	1.117
26		0.322	0.322	0.322	0.504	0.552	0.770	0.829	0.961	1.245
28		0.373	0.373	0.373	0.573	0.628	0.863	0.929	1.071	1.379
30		0.428	0.428	0.428	0.647	0.709	0.961	1.037	1.187	1.521
32		0.487	0.487	0.487	0.725	0.795	1.065	1.147	1.308	1.669
34		0.550	0.550	0.550	0.808	0.886	1.174	1.264	1.436	1.824
36		0.617	0.617	0.617	0.895	0.981	1.289	1.388	1.570	1.986
38		0.687	0.687	0.687	0.987	1.082	1.409	1.517	1.709	2.155
40		0.762	0.762	0.762	1.083	1.187	1.534	1.651	1.854	2.331
42		0.840	0.840	0.840	1.184	1.298	1.664	1.792	2.006	2.514
44		0.921	0.921	0.921	1.289	1.413	1.800	1.938	2.163	2.704
46		1.007	1.007	1.007	1.399	1.533	1.941	2.090	2.326	2.900
48		1.097	1.097	1.097	1.513	1.658	2.063	2.248	2.495	3.104
50			1.260	1.260	1.631	1.788	2.239	2.411	2.670	3.314
52			1.363	1.363	1.755	1.923	2.397	2.580	2.851	3.531
54			1.470	1.470	1.868	2.063	2.559	2.755	3.038	3.755
56			1.581	1.581	1.988	2.208	2.727	2.936	3.231	3.986
58					2.117	2.358	2.900	3.122	3.430	4.224
60					2.245	2.512	3.078	3.314	3.635	4.469
62					2.373	2.670	3.262	3.512	3.845	4.721
64					2.501	2.851	3.451	3.716	4.052	
66					2.629	3.038	3.645	3.925		
68					2.757	3.163				
70					2.885	3.288				
72					3.013	3.413				
74					3.141	3.538				

EQUATION: $V = (C_1 \cdot 0.0043891 \cdot D^3 \cdot H) - (0.04365 \cdot B^2) \cdot H^2 / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBHOB; $H =$ TOTAL HEIGHT;
 $B^2 = 0.145$; $C_1 = 0.948$; $C_2 = 401.456$

DATA SOURCE: 140 TREES FROM ONT.
 ACCURACY: + OR - 25.5 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TOP INCLUDED)

BEECH / FAGUS GRANDIFOLIA EHRH.

DBHOB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.024	0.026	0.077	0.083	0.168	0.195
4	0.003	0.006	0.009	0.009	0.042	0.046	0.111	0.120	0.220	0.254
6	0.007	0.014	0.020	0.021	0.065	0.071	0.152	0.163	0.279	0.322
8	0.013	0.025	0.036	0.038	0.094	0.103	0.198	0.213	0.344	0.398
10	0.020	0.039	0.056	0.059	0.128	0.140	0.251	0.269	0.416	0.481
12	0.029	0.056	0.080	0.085	0.167	0.183	0.310	0.333	0.495	0.572
14	0.040	0.076	0.109	0.116	0.212	0.232	0.375	0.402	0.581	0.672
16	0.052	0.099	0.147	0.151	0.262	0.286	0.446	0.479	0.674	0.779
18		0.126	0.181	0.191	0.316	0.346	0.523	0.562	0.774	0.894
20		0.155	0.223	0.236	0.377	0.412	0.607	0.652	0.880	1.018
22		0.188	0.270	0.286	0.442	0.483	0.697	0.748	0.994	1.149
24		0.224	0.322	0.340	0.513	0.560	0.793	0.852	1.114	1.288
26			0.377	0.399	0.588	0.643	0.895	0.961	1.241	1.435
28			0.438	0.463	0.669	0.732	0.927	1.078	1.375	1.590
30			0.502	0.532	0.756	0.826	1.032	1.201	1.516	1.753
32			0.572	0.605	0.847	0.927	1.118	1.331	1.664	1.924
34			0.645	0.683	0.944	1.032	1.239	1.467	1.819	2.103
36			0.724	0.765	0.944	1.046	1.261	1.510	1.981	2.290
38			0.806	0.853	0.944	1.144	1.366	1.610	2.079	2.484
40			0.893	0.945	1.046	1.261	1.499	1.760	2.325	2.687
42			0.985	1.042	1.153	1.384	1.638	1.916	2.507	2.898
44			1.081	1.143	1.266	1.513	1.784	2.097	2.696	3.116
46			1.181	1.250	1.383	1.647	1.935	2.249	2.892	3.343
48			1.286	1.361	1.506	1.787	2.093	2.428	3.095	3.578
50				1.477	1.634	1.933	2.257	2.604	3.305	3.820
52				1.597	1.768	2.085	2.428	2.797	3.521	4.071
54				1.722	1.906	2.242	2.604	2.994	3.745	4.329
56				1.852	2.050	2.405	2.787	3.197	4.075	4.595
58					2.405	2.574	2.976	3.406	4.212	4.869
60					2.574	2.748	3.171	3.622	4.456	5.152
62					2.748	2.928	3.372	3.845	4.707	5.442
64							3.580	4.075		
66							3.793	4.311		
70							4.013	4.554		
72							4.239			
74										

EQUATION: $V = (C \cdot 0.043891 \cdot D \cdot H^3) / (C1 + 0.3048 \cdot C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHOB; H = TOTAL HEIGHT;
 B2 = 0.145; C1 = 0.959; C2 = 334.829

DATA SOURCE: 388 TREES FROM ONT.
 ACCURACY: ± OR - 25.1 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TCP INCLUDED)
 BLACK CHERRY / PRUNUS SEROTINA EHRH.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.002	0.002	0.002	0.023	0.026	0.079	0.086	0.176	0.211
4	0.006	0.009	0.009	0.009	0.041	0.046	0.114	0.124	0.230	0.275
6	0.013	0.021	0.021	0.021	0.065	0.072	0.155	0.169	0.291	0.348
8	0.023	0.037	0.037	0.037	0.093	0.104	0.205	0.221	0.359	0.430
10	0.036	0.058	0.058	0.058	0.127	0.141	0.256	0.279	0.434	0.521
12	0.052	0.083	0.083	0.083	0.166	0.184	0.316	0.345	0.517	0.620
14	0.071	0.113	0.113	0.113	0.210	0.233	0.383	0.417	0.607	0.727
16	0.092	0.147	0.147	0.147	0.259	0.288	0.455	0.496	0.704	0.843
18	0.117	0.187	0.187	0.187	0.313	0.348	0.534	0.583	0.808	0.968
20	0.144	0.230	0.230	0.230	0.373	0.414	0.620	0.676	0.919	1.101
22	0.174	0.279	0.279	0.279	0.438	0.486	0.711	0.776	1.038	1.243
24	0.208	0.311	0.311	0.311	0.508	0.564	0.809	0.883	1.163	1.394
26		0.365	0.365	0.365	0.583	0.647	0.932	1.024	1.296	1.553
28		0.423	0.423	0.423	0.663	0.736	1.024	1.117	1.436	1.721
30		0.486	0.486	0.486	0.748	0.831	1.141	1.245	1.583	1.897
32		0.553	0.553	0.553	0.839	0.932	1.141	1.245	1.583	1.897
34		0.624	0.624	0.624	0.932	1.038	1.265	1.379	1.738	2.082
36		0.700	0.700	0.700	1.038	1.150	1.394	1.520	1.899	2.276
38		0.831	0.831	0.831	1.141	1.268	1.530	1.669	2.068	2.478
40		0.921	0.921	0.921	1.253	1.392	1.673	1.824	2.244	2.689
42		0.953	0.953	0.953	1.370	1.521	1.821	1.985	2.427	2.908
44		1.045	1.045	1.045	1.492	1.657	1.976	2.155	2.617	3.136
46		1.143	1.143	1.143	1.619	1.797	2.137	2.330	2.815	3.373
48		1.244	1.244	1.244	1.751	1.944	2.305	2.513	3.019	3.618
50					1.888	2.097	2.479	2.659	3.231	3.872
52					2.030	2.255	2.659	2.899	3.450	4.134
54						2.419	2.659	2.899	3.676	4.405
56						2.588	2.846	3.103	3.910	4.685
58						2.764	3.039	3.313	4.150	4.973
60						2.945	3.238	3.530	4.398	5.270
62							3.443	3.754	4.653	5.576
64							3.655	4.023	4.915	
66							3.873	4.223	5.150	
68							4.098	4.468	5.398	
70							4.329	4.720	5.685	
72									5.973	
74									6.270	

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) * H) / (C1 + 0.3048 * C2 / H)$
 WHERE: $V =$ TOTAL VOLUME; $D =$ DBHCB; $H =$ TOTAL HEIGHT;
 $B2 = C.145$; $C1 = 0.033$; $C2 = 393.336$

DATA SOURCE: 21 TREES FROM ONT.
 ACCURACY: + OF - 19.8 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TCP INCLUDED)

WHITE ELM / ULMUS AMERICANA L.

DBH/CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.019	0.021	0.064	0.070	0.141	0.166
4	0.005	0.005	0.007	0.008	0.034	0.038	0.093	0.100	0.185	0.217
6	0.011	0.011	0.016	0.017	0.054	0.059	0.126	0.136	0.234	0.275
8	0.020	0.020	0.029	0.031	0.077	0.085	0.165	0.178	0.289	0.339
10	0.031	0.031	0.045	0.048	0.105	0.116	0.257	0.278	0.349	0.411
12	0.044	0.044	0.065	0.069	0.137	0.151	0.311	0.337	0.416	0.489
14	0.060	0.060	0.089	0.094	0.214	0.236	0.371	0.401	0.488	0.573
16	0.079	0.079	0.116	0.123	0.259	0.340	0.435	0.470	0.566	0.665
18	0.100	0.100	0.146	0.156	0.308	0.399	0.504	0.546	0.650	0.763
20	0.123	0.123	0.181	0.192	0.362	0.462	0.579	0.626	0.739	0.869
22	0.149	0.149	0.219	0.232	0.420	0.531	0.659	0.713	0.834	0.980
24	0.178	0.178	0.260	0.277	0.548	0.604	0.744	0.804	0.935	1.099
26			0.306	0.325	0.619	0.682	0.834	0.902	1.042	1.225
28			0.354	0.376	0.694	0.764	0.929	1.005	1.155	1.357
30			0.407	0.432	0.773	0.852	1.029	1.113	1.273	1.496
32			0.463	0.492	0.845	0.944	1.135	1.227	1.397	1.642
34			0.523	0.555	0.937	1.040	1.245	1.347	1.527	1.795
36			0.586	0.622	1.037	1.142	1.361	1.472	1.663	1.954
38			0.653	0.693	1.133	1.248	1.482	1.603	1.804	2.120
40			0.723	0.768	1.234	1.359	1.608	1.740	1.952	2.293
42			0.798	0.847	1.339	1.475	1.739	1.881	2.105	2.473
44			0.875	0.930	1.448	1.595	1.876	2.029	2.263	2.660
46			0.957	1.016	1.561	1.720	2.017	2.182	2.428	2.853
48			1.042	1.106	1.679	1.850	2.164	2.341	2.598	3.053
50				1.200	1.808	1.984	2.316	2.505	2.774	3.260
52				1.298	1.948	2.267	2.473	2.675	2.956	3.474
54				1.400	1.561	2.416	2.635	2.850	3.144	3.695
56				1.506	1.679		2.802	3.031	3.337	3.922
58							2.975	3.217	3.537	4.156
60							3.152	3.409	3.742	4.397
62							3.335	3.607	3.952	4.645
64							3.523	3.810		
66										
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBH/CLASS; H = TOTAL HEIGHT;
 B2 = 0.145; C1 = 0.634; C2 = 440.496
 DATA SOURCE: 62 TREES FROM ONT.
 ACCURACY: ± OR - 28.1 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
(STUMP AND TOP INCLUDED)

IRONWOOD / CSTRYA VIRGINIANA (MILL.) K. KOCH

DBH CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.021	0.062	0.067	0.071	0.143	0.162
4	0.003	0.006	0.008	0.008	0.037	0.049	0.096	0.102	0.237	0.267
6	0.007	0.013	0.018	0.019	0.083	0.090	0.131	0.139	0.292	0.330
8	0.013	0.023	0.032	0.034	0.113	0.122	0.171	0.182	0.354	0.399
10	0.020	0.036	0.050	0.053	0.148	0.160	0.217	0.230	0.421	0.475
12	0.028	0.052	0.072	0.076	0.187	0.202	0.267	0.284	0.573	0.646
14	0.038	0.071	0.098	0.103	0.231	0.250	0.323	0.344	0.742	0.742
16	0.050	0.092	0.128	0.135	0.332	0.359	0.452	0.409	0.845	0.845
18	0.050	0.117	0.163	0.171	0.452	0.489	0.524	0.557	0.947	0.947
20	0.144	0.201	0.201	0.211	0.519	0.562	0.601	0.639	1.055	1.055
22	0.175	0.243	0.243	0.255	0.591	0.639	0.684	0.727	1.169	1.169
24	0.208	0.289	0.289	0.304	0.667	0.721	0.773	0.821	1.319	1.319
26		0.335	0.335	0.357	0.748	0.809	0.866	0.921	1.454	1.454
28		0.393	0.393	0.414	0.833	0.901	0.965	1.026	1.596	1.596
30		0.452	0.452	0.475	0.918	0.998	1.069	1.137	1.745	1.745
32		0.514	0.514	0.540	1.018	1.101	1.179	1.253	1.900	1.900
34		0.580	0.580	0.610	1.117	1.208	1.294	1.375	2.061	2.061
36		0.650	0.650	0.684	1.221	1.320	1.414	1.503	2.229	2.229
38		0.725	0.725	0.762	1.330	1.438	1.540	1.637	2.404	2.404
40		0.803	0.803	0.844	1.443	1.560	1.671	1.776	2.586	2.586
42		0.885	0.885	0.931	1.561	1.687	1.807	1.921	2.774	2.774
44		0.972	0.972	1.022	1.683	1.819	1.949	2.071	2.968	2.968
46		1.052	1.052	1.117	1.810	1.957	2.096	2.228	3.169	3.169
48		1.156	1.156	1.216	1.955	2.111	2.248	2.390	3.377	3.377
50			1.319	1.427	1.561	1.711	1.848	1.990	3.592	3.592
52			1.427	1.539	1.683	1.839	1.986	2.130	3.813	3.813
54			1.539	1.655	1.810	1.999	2.146	2.288	4.040	4.040
56			1.655			2.398	2.556	2.701	4.274	4.274
58						2.556		2.701	4.515	4.515
60										
62										
64										
66										
68										
70										
72										
74										

EQUATION: $V = (0.0043891 * D * D * (1 - 0.04365 * B2) ** 2) / (C1 + 0.3048 * C2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBHCB; H = TOTAL HEIGHT;
 B2 = 0.145; C1 = 1.877; C2 = 332.585

DATA SOURCE: 147 TREES FROM CNT.
 ACCURACY: + OR - 23.6 PERCENT AT 95% CONFIDENCE LEVEL

TOTAL VOLUME (CUBIC METRES)
 (STUMP AND TOP INCLUDED)
 RED OAK / QUERCUS RUBRA L.

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
2	0.001	0.001	0.002	0.002	0.022	0.023	0.070	0.075	0.151	0.172
4	0.003	0.006	0.008	0.009	0.038	0.042	0.101	0.108	0.198	0.225
6	0.007	0.013	0.019	0.020	0.060	0.065	0.138	0.147	0.250	0.285
8	0.013	0.024	0.033	0.035	0.087	0.094	0.180	0.192	0.309	0.352
10	0.020	0.037	0.052	0.055	0.118	0.128	0.227	0.243	0.374	0.425
12	0.028	0.053	0.072	0.079	0.154	0.167	0.340	0.363	0.445	0.506
14	0.039	0.072	0.102	0.107	0.195	0.211	0.474	0.506	0.522	0.594
16	0.050	0.094	0.133	0.140	0.240	0.261	0.550	0.574	0.695	0.689
18		0.119	0.168	0.177	0.291	0.316	0.632	0.674	0.790	0.900
20		0.147	0.208	0.219	0.346	0.376	0.719	0.767	0.892	1.016
22		0.178	0.251	0.265	0.406	0.441	0.811	0.866	1.000	1.139
24		0.212	0.299	0.315	0.471	0.512	0.910	0.971	1.115	1.269
26			0.351	0.370	0.541	0.587	1.014	1.082	1.235	1.406
28			0.407	0.429	0.615	0.668	1.123	1.198	1.362	1.550
30			0.467	0.492	0.695	0.754	1.238	1.321	1.494	1.702
32			0.531	0.560	0.779	0.846	1.359	1.450	1.633	1.860
34			0.600	0.632	0.868	0.942	1.485	1.585	1.778	2.025
36			0.673	0.709	0.962	1.044	1.617	1.726	1.930	2.197
38			0.749	0.790	1.060	1.151	1.755	1.873	2.087	2.377
40			0.830	0.875	1.164	1.263	1.898	2.025	2.251	2.563
42			0.916	0.965	1.272	1.381	2.047	2.184	2.421	2.756
44			1.005	1.059	1.385	1.504	2.361	2.520	2.779	3.164
46			1.098	1.157	1.503	1.632	2.527	2.697	2.967	3.378
48			1.196	1.260	1.625	1.765	2.698	2.879	3.161	3.600
50				1.368	1.753	1.903	2.875	3.068	3.362	3.828
52				1.479	1.885	2.047	3.058	3.263	3.569	4.064
54				1.595		2.195	3.246	3.464	3.782	4.307
56				1.715		2.349	3.439	3.670	4.001	4.556
58						2.509	3.639	3.883	4.227	4.813
60						2.673	3.844	4.102		

EQUATION: $V = (C_0 \cdot 0.043891 \cdot D \cdot H^2 - 0.04365 \cdot B^2) \cdot H^2 / (C_1 + 0.3048 \cdot C_2 / H)$
 WHERE: V = TOTAL VOLUME; D = DBH@H; H = TOTAL HEIGHT;
 B2 = 0.145; C1 = 1.512; C2 = 336.509

DATA SOURCE: 40 TREES FROM ONT.
 ACCURACY: ± OR - 13.8 PERCENT AT 95% CONFIDENCE LEVEL

APPENDIX II Merchantable Cubic Metre Volume Tables

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MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 EASTERN WHITE PINE / PINUS STROBUS L.

DBHCB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.042	0.046	0.051	0.055	0.143	0.167
12	0.022	0.042	0.062	0.065	0.073	0.080	0.087	0.094	0.138	0.227
14	0.032	0.062	0.091	0.096	0.107	0.117	0.128	0.138	0.251	0.367
16	0.043	0.084	0.123	0.130	0.145	0.159	0.174	0.187	0.314	0.449
18		0.109	0.159	0.169	0.188	0.206	0.225	0.242	0.384	0.537
20		0.137	0.195	0.211	0.235	0.258	0.281	0.303	0.460	0.634
22		0.167	0.243	0.258	0.287	0.316	0.343	0.371	0.542	0.738
24		0.200	0.344	0.344	0.406	0.446	0.485	0.523	0.727	0.968
26			0.400	0.425	0.472	0.519	0.569	0.609	0.800	1.095
28			0.461	0.489	0.544	0.597	0.650	0.701	0.937	1.371
30			0.525	0.557	0.620	0.681	0.741	0.800	1.052	1.521
32			0.594	0.630	0.701	0.770	0.838	0.904	1.174	1.678
34			0.667	0.708	0.787	0.865	0.941	1.015	1.302	1.843
36			0.744	0.789	0.878	0.965	1.050	1.133	1.436	2.016
38			0.826	0.876	0.974	1.070	1.164	1.256	1.578	2.196
40			0.911	0.966	1.075	1.181	1.285	1.386	1.725	2.384
42			1.000	1.061	1.180	1.297	1.411	1.523	1.880	2.580
44			1.094	1.160	1.291	1.418	1.543	1.665	2.040	2.783
46			1.192	1.264	1.406	1.548	1.681	1.814	2.208	2.994
48				1.372	1.527	1.678	1.825	1.969	2.382	3.213
50				1.485	1.652	1.815	1.975	2.131	2.562	3.439
52				1.602	1.782	1.958	2.130	2.299	2.749	3.673
54				1.724	1.917	2.107	2.292	2.473	2.943	3.914
56						2.260	2.459	2.654	3.143	4.164
58						2.420	2.632	2.841	3.350	4.421
60						2.584	2.812	3.034	3.563	4.685
62						2.754	2.996	3.233	3.783	4.958
64							3.187	3.439	4.010	5.237
66							3.384	3.652	4.243	
68							3.587	3.870	4.482	
70							3.795	4.095		
72							4.009	4.326		
74										

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9735 ; R2 = -0.2348 ; R3 = -0.7378

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S / H)$

T = TOP DIAMETER ; D = CBHOB ; B2 = 0.184 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1169 TREES FROM N.B., QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 RED PINE / PINUS RESINOSA AIT.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.040	0.044	0.048	0.053	0.057	0.150	0.175
12	0.023	0.045	0.065	0.069	0.077	0.084	0.091	0.099	0.202	0.236
14	0.034	0.065	0.095	0.101	0.112	0.123	0.134	0.144	0.260	0.304
16	0.045	0.088	0.128	0.136	0.151	0.166	0.181	0.195	0.325	0.379
18		0.114	0.165	0.175	0.195	0.214	0.233	0.251	0.396	0.462
20		0.142	0.206	0.219	0.243	0.267	0.291	0.314	0.473	0.552
22		0.173	0.251	0.267	0.296	0.326	0.354	0.382	0.556	0.649
24		0.206	0.300	0.319	0.354	0.389	0.423	0.456	0.646	0.754
26			0.354	0.375	0.417	0.458	0.498	0.537	0.743	0.867
28			0.411	0.436	0.484	0.532	0.579	0.624	0.846	0.988
30			0.472	0.501	0.557	0.612	0.665	0.717	0.956	1.116
32			0.538	0.571	0.634	0.697	0.758	0.823	1.073	1.252
34			0.608	0.645	0.717	0.787	0.856	0.923	1.196	1.396
36			0.682	0.723	0.804	0.883	0.960	1.036	1.325	1.547
38			0.760	0.806	0.896	0.984	1.070	1.154	1.462	1.706
40			0.843	0.893	0.993	1.091	1.186	1.280	1.605	1.873
42			0.929	0.985	1.096	1.203	1.308	1.411	1.754	2.047
44			1.020	1.082	1.203	1.321	1.436	1.549	1.910	2.230
46			1.115	1.183	1.315	1.444	1.570	1.693	2.073	2.420
48			1.215	1.288	1.432	1.572	1.710	1.844	2.243	2.617
50				1.398	1.554	1.706	1.856	2.001	2.335	2.823
52				1.512	1.681	1.846	2.007	2.165	2.511	3.036
54				1.631	1.813	1.991	2.165	2.335	2.694	3.257
56				1.754	1.950	2.141	2.328	2.511	2.987	3.486
58					1.950	2.297	2.498	2.694	3.189	3.722
60					2.151	2.459	2.673	2.879	3.399	3.967
62					2.354	2.625	2.855	3.079	3.614	4.219
64					2.558	2.798	3.042	3.281	3.837	4.478
66					2.762	2.978	3.235	3.490	4.066	4.746
68					2.966	3.141	3.435	3.704	4.302	5.021
70					3.170	3.311	3.640	3.926	4.544	5.304
72					3.374	3.481	3.851	4.153		
74					3.578	3.648	4.068	4.387		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9672 ; R2 = -0.0393 ; R3 = -1.0523

$X3 = (T * T / (C * C * ((1 - C * C * 365 * B2) * * 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = DBHCE ; B2 = 0.151 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1333 TREES FROM N.B., QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 JACK PINE / PINUS BANKSIANA LAMB.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.039	0.044	0.042	0.052	0.056	0.144	0.167
12	0.023	0.044	0.064	0.067	0.075	0.082	0.089	0.095	0.195	0.226
14	0.033	0.064	0.093	0.098	0.109	0.119	0.129	0.138	0.251	0.291
16	0.045	0.087	0.126	0.133	0.147	0.161	0.175	0.188	0.314	0.364
18		0.112	0.162	0.171	0.190	0.208	0.226	0.243	0.383	0.444
20		0.140	0.202	0.214	0.238	0.260	0.282	0.303	0.458	0.531
22		0.171	0.247	0.261	0.290	0.317	0.344	0.370	0.539	0.625
24		0.204	0.295	0.313	0.347	0.379	0.412	0.443	0.627	0.727
26			0.348	0.368	0.408	0.447	0.485	0.521	0.722	0.837
28			0.405	0.428	0.475	0.520	0.564	0.606	0.822	0.954
30			0.465	0.493	0.546	0.598	0.649	0.698	0.930	1.078
32			0.530	0.562	0.623	0.682	0.739	0.795	1.043	1.210
34			0.600	0.635	0.704	0.771	0.836	0.899	1.164	1.349
36			0.673	0.712	0.790	0.865	0.938	1.009	1.290	1.496
38			0.750	0.794	0.881	0.964	1.046	1.125	1.423	1.650
40			0.832	0.881	0.977	1.069	1.160	1.247	1.563	1.812
42			0.918	0.972	1.077	1.180	1.279	1.376	1.709	1.982
44			1.008	1.067	1.183	1.295	1.405	1.511	1.861	2.158
46			1.102	1.167	1.293	1.416	1.536	1.652	2.020	2.343
48			1.201	1.271	1.409	1.543	1.673	1.799	2.186	2.535
50				1.380	1.529	1.675	1.816	1.953	2.358	2.734
52				1.493	1.655	1.812	1.965	2.113	2.536	2.941
54				1.610	1.785	1.954	2.119	2.279	2.721	3.155
56				1.732	1.920	2.102	2.280	2.452	2.913	3.377
58						2.256	2.446	2.631	3.111	3.607
60						2.414	2.618	2.816	3.315	3.844
62						2.578	2.796	3.007	3.526	4.088
64						2.748	2.979	3.205	3.743	4.340
66							3.169	3.408	3.967	4.600
68							3.364	3.619	4.197	4.867
70							3.565	3.835	4.434	5.142
72							3.773	4.058		
74							3.985	4.287		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9635 ; R2 = -0.1500 ; R3 = -0.8081

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.151 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 6166 TREES FROM QUE., ONT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DBH@E CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.014	0.027	0.040	0.042	0.047	0.051	0.056	0.060	0.153	0.179
12	0.024	0.046	0.067	0.071	0.079	0.087	0.094	0.102	0.207	0.242
14	0.035	0.067	0.098	0.103	0.115	0.126	0.137	0.148	0.267	0.312
16	0.047	0.090	0.132	0.140	0.155	0.171	0.185	0.200	0.333	0.389
18		0.117	0.170	0.180	0.200	0.220	0.239	0.258	0.406	0.474
20		0.146	0.212	0.225	0.250	0.274	0.298	0.322	0.469	0.567
22		0.178	0.258	0.274	0.305	0.334	0.364	0.392	0.572	0.668
24		0.212	0.309	0.328	0.364	0.400	0.435	0.469	0.665	0.776
26			0.364	0.386	0.429	0.471	0.512	0.552	0.765	0.893
28			0.423	0.449	0.499	0.548	0.595	0.642	0.872	1.017
30			0.487	0.516	0.574	0.630	0.685	0.739	0.985	1.150
32			0.555	0.588	0.654	0.718	0.780	0.842	1.106	1.290
34			0.627	0.665	0.739	0.811	0.882	0.951	1.233	1.439
36			0.703	0.746	0.829	0.910	0.990	1.067	1.367	1.595
38			0.784	0.831	0.924	1.015	1.104	1.190	1.508	1.759
40			0.869	0.922	1.025	1.125	1.224	1.320	1.656	1.932
42			0.959	1.017	1.131	1.241	1.350	1.456	1.810	2.112
44			1.053	1.117	1.241	1.363	1.482	1.598	1.972	2.301
46			1.151	1.221	1.357	1.490	1.621	1.748	2.140	2.497
48			1.254	1.330	1.478	1.623	1.765	1.904	2.315	2.701
50				1.443	1.605	1.762	1.916	2.066	2.497	2.914
52				1.562	1.736	1.906	2.073	2.235	2.686	3.134
54				1.684	1.872	2.056	2.236	2.411	2.882	3.363
56				1.812	2.014	2.212	2.405	2.593	3.085	3.599
58						2.373	2.580	2.778	3.294	3.844
60						2.540	2.761	2.978	3.510	4.096
62						2.712	2.949	3.189	3.734	4.357
64						2.890	3.143	3.389	3.964	4.625
66							3.343	3.605	4.201	4.902
68							3.549	3.827	4.445	5.186
70							3.761	4.056	4.695	5.479
72							3.979	4.291		
74							4.204	4.533		

EQUATION: $VM = V * ((R1 + R2 * X3 + R3 * X3 * X3))$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9658 ; R2 = -0.1278 ; R3 = -0.8108

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBH@B ; B2 = 0.118 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 850 TREES FROM ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.014				0.042	0.045	0.049	0.052		0.149
12	0.023	0.025	0.036	0.038	0.070	0.076	0.082	0.088	0.131	0.201
14	0.034	0.043	0.061	0.064	0.102	0.111	0.119	0.127	0.177	0.258
16	0.045	0.063	0.088	0.093	0.138	0.150	0.161	0.171	0.227	0.322
18		0.085	0.119	0.126	0.178	0.193	0.207	0.231	0.284	0.393
20		0.109	0.154	0.162	0.222	0.241	0.258	0.276	0.346	0.470
22		0.136	0.192	0.202	0.270	0.293	0.315	0.336	0.413	0.552
24		0.166	0.234	0.246	0.323	0.350	0.376	0.401	0.487	0.643
26		0.199	0.279	0.289	0.380	0.412	0.443	0.474	0.566	0.739
28			0.322	0.346	0.442	0.480	0.515	0.549	0.651	0.842
30			0.440	0.463	0.508	0.551	0.592	0.632	0.741	0.952
32			0.501	0.528	0.575	0.628	0.675	0.720	0.838	1.068
34			0.566	0.596	0.655	0.710	0.763	0.813	0.940	1.191
36			0.635	0.669	0.734	0.797	0.856	0.912	1.048	1.320
38			0.708	0.746	0.819	0.888	0.954	1.017	1.162	1.456
40			0.785	0.827	0.908	0.985	1.058	1.128	1.281	1.598
42			0.866	0.912	1.001	1.086	1.167	1.244	1.407	1.748
44			0.951	1.005	1.099	1.193	1.281	1.366	1.538	1.903
46			1.040	1.095	1.202	1.304	1.401	1.493	1.675	2.066
48			1.132	1.193	1.309	1.420	1.526	1.627	1.818	2.235
50				1.295	1.421	1.541	1.656	1.765	1.967	2.377
52				1.401	1.537	1.667	1.791	1.910	2.122	2.544
54				1.511	1.658	1.798	1.932	2.060	2.282	2.717
56				1.625	1.783	1.934	2.078	2.216	2.448	2.896
58						2.075	2.230	2.377	2.621	3.080
60						2.221	2.387	2.544	2.798	3.267
62						2.372	2.543	2.717	2.982	3.367
64						2.528	2.716	2.896	3.172	3.465
66							2.889	3.080	3.269	3.569
68							3.067	3.269	3.465	3.776
70							3.250	3.465	3.666	3.989
72							3.438	3.666	3.873	
74							3.632	3.873		

EQUATION: VM=V*(F1 + R2*X3 + R3*X3*X3)

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9526 ; R2 = -0.1027 ; R3 = -0.8199

X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)

T = TOP DIAMETER ; D = DBHOE ; B2 = 0.164 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 7442 TREES FROM NFLD., N.B., QUE., CNT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TCP DIAMETER INSIDE BARK = 7.0 CM)
 RED SPRUCE / PICEA RUBENS SARG.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.015	0.029	0.041	0.043	0.047	0.052	0.056	0.060	0.148	0.170
12	0.025	0.048	0.068	0.072	0.079	0.086	0.093	0.100	0.200	0.229
14	0.037	0.069	0.095	0.104	0.115	0.125	0.135	0.144	0.257	0.294
16	0.049	0.093	0.133	0.140	0.154	0.168	0.181	0.194	0.320	0.367
18		0.120	0.171	0.180	0.198	0.216	0.233	0.249	0.390	0.446
20		0.150	0.213	0.224	0.247	0.269	0.290	0.310	0.466	0.534
22		0.182	0.259	0.273	0.301	0.328	0.353	0.378	0.549	0.628
24		0.218	0.310	0.327	0.385	0.461	0.497	0.452	0.638	0.730
26			0.364	0.447	0.424	0.536	0.578	0.532	0.735	0.839
28			0.487	0.514	0.492	0.616	0.665	0.618	0.844	0.956
30			0.555	0.586	0.566	0.702	0.757	0.711	0.959	1.081
32			0.627	0.662	0.645	0.794	0.856	0.810	1.059	1.212
34			0.703	0.742	0.729	0.893	0.960	0.915	1.181	1.352
36			0.784	0.828	0.812	0.993	1.070	1.027	1.309	1.499
38			0.869	0.918	0.911	1.101	1.186	1.145	1.444	1.653
40			0.959	1.012	1.015	1.214	1.309	1.269	1.585	1.815
42			1.053	1.111	1.1224	1.333	1.437	1.400	1.733	1.984
44			1.151	1.215	1.224	1.457	1.571	1.537	1.888	2.161
46			1.254	1.323	1.458	1.587	1.711	1.680	2.049	2.345
48				1.436	1.582	1.722	1.857	1.830	2.217	2.537
50				1.554	1.712	1.863	2.009	1.986	2.391	2.737
52				1.676	1.846	2.010	2.167	2.148	2.572	2.944
54				1.803	1.986	2.162	2.331	2.318	2.759	3.158
56						2.319	2.500	2.493	2.953	3.380
58						2.482	2.676	2.674	3.153	3.610
60						2.651	2.858	2.862	3.360	3.847
62						2.825	3.045	3.057	3.574	4.091
64							3.239	3.257	3.794	4.343
66							3.439	3.464	4.021	4.603
68							3.644	3.678	4.254	4.870
70							3.855	4.124	4.494	5.145
72							4.073	4.357		
74										

EQUATION: $VM = V*(R1 + R2*X3 + R3*X3*X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9644 ; R2 = -0.0995 ; R3 = -0.7658

$X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)$

T = TCP DIAMETER ; D = DBHCE ; B2 = 0.169 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 227 TREES FROM N.B.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TCP DIAMETER INSIDE BARK = 7.0 CM)
 WHITE SPRUCE / PICEA GLAUCA (MOENCH) VOSS

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.034	0.036	0.040	0.043	0.047	0.050	0.125	0.147
12	0.022	0.041	0.059	0.062	0.068	0.074	0.080	0.085	0.175	0.200
14	0.032	0.061	0.086	0.091	0.100	0.109	0.117	0.125	0.226	0.258
16	0.044	0.083	0.117	0.123	0.136	0.147	0.159	0.170	0.283	0.323
18		0.107	0.151	0.160	0.176	0.191	0.205	0.219	0.346	0.395
20		0.134	0.189	0.200	0.220	0.239	0.257	0.275	0.415	0.473
22		0.164	0.231	0.244	0.268	0.292	0.314	0.336	0.489	0.558
24		0.196	0.277	0.327	0.345	0.379	0.412	0.474	0.569	0.650
26			0.327	0.401	0.441	0.480	0.517	0.552	0.655	0.748
28			0.438	0.462	0.508	0.553	0.595	0.636	0.747	0.853
30			0.500	0.527	0.580	0.630	0.678	0.725	0.845	0.965
34			0.565	0.596	0.656	0.713	0.767	0.820	0.949	1.083
36			0.634	0.669	0.736	0.800	0.861	0.920	1.058	1.208
38			0.708	0.746	0.821	0.893	0.961	1.027	1.174	1.340
40			0.785	0.828	0.911	0.990	1.066	1.139	1.295	1.479
42			0.866	0.913	1.005	1.092	1.176	1.257	1.423	1.624
44			0.951	1.007	1.104	1.200	1.292	1.380	1.556	1.776
46			1.040	1.097	1.207	1.312	1.413	1.509	1.695	1.935
48			1.134	1.195	1.315	1.430	1.539	1.644	1.840	2.101
50				1.298	1.428	1.552	1.671	1.785	1.992	2.273
52				1.404	1.545	1.679	1.808	1.932	2.148	2.452
54				1.515	1.667	1.812	1.951	2.084	2.311	2.638
56				1.630	1.793	1.949	2.099	2.242	2.480	2.831
58						2.091	2.252	2.406	2.655	3.030
60						2.239	2.410	2.575	2.835	3.256
62						2.391	2.574	2.750	3.022	3.449
64						2.548	2.744	2.931	3.214	3.669
66							2.919	3.118	3.413	3.896
68							3.099	3.310	3.617	4.129
70							3.284	3.509	3.827	4.369
72							3.475	3.712	4.044	
74							3.671	3.922		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9611 ; R2 = -0.2456 ; R3 = -0.6801

$X3 = (T * (D * D * ((1 - 0.04365 * R2) * #2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBH08 ; B2 = 0.176 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2692 TREES FROM N.B., QUE., ONT., MAN., SASK., ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.015	0.027	0.037	0.039	0.043	0.046	0.049	0.052	0.127	0.142
12	0.025	0.045	0.062	0.065	0.071	0.076	0.081	0.086	0.171	0.191
14	0.036	0.065	0.090	0.094	0.102	0.110	0.117	0.124	0.219	0.245
16	0.048	0.088	0.120	0.126	0.137	0.148	0.157	0.166	0.273	0.305
18		0.113	0.154	0.162	0.176	0.190	0.202	0.214	0.332	0.372
20		0.140	0.192	0.202	0.219	0.236	0.252	0.266	0.397	0.444
22		0.171	0.234	0.245	0.267	0.287	0.306	0.324	0.467	0.522
24		0.204	0.279	0.293	0.319	0.343	0.365	0.387	0.543	0.606
26			0.329	0.344	0.375	0.403	0.430	0.455	0.624	0.697
28			0.382	0.400	0.435	0.468	0.499	0.529	0.710	0.794
30			0.435	0.460	0.501	0.538	0.574	0.608	0.802	0.897
32			0.500	0.524	0.570	0.613	0.654	0.692	0.900	1.006
34			0.564	0.592	0.644	0.693	0.739	0.782	1.003	1.121
36			0.633	0.664	0.722	0.777	0.828	0.877	1.126	1.243
38			0.706	0.740	0.805	0.866	0.923	0.977	1.346	1.504
40			0.782	0.820	0.892	0.960	1.024	1.083	1.471	1.645
42			0.862	0.904	0.984	1.059	1.129	1.195	1.602	1.791
44			0.947	0.993	1.080	1.162	1.239	1.311	1.739	1.944
46			1.035	1.085	1.181	1.270	1.355	1.434	1.881	2.102
48			1.127	1.182	1.286	1.384	1.475	1.561	2.029	2.268
50				1.283	1.396	1.501	1.601	1.694	2.182	2.439
52				1.387	1.510	1.624	1.732	1.833	2.341	2.616
54				1.496	1.628	1.752	1.868	1.977	2.505	2.800
56					1.751	1.884	2.009	2.126	2.675	3.089
58						2.021	2.155	2.281	2.850	3.186
60						2.163	2.306	2.441	3.032	3.389
62						2.310	2.463	2.606	3.218	3.597
64						2.461	2.624	2.777	3.410	3.812
66							2.791	2.954	3.608	4.033
68							2.963	3.136		
70							3.140	3.323		
72							3.322	3.516		
74							3.509	3.714		

EQUATION: $VM = V*(R1 + R2*X3 + R3*X3*X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9352 ; R2 = -0.0395 ; R3 = -0.8147

$X3 = (T*(1 - 0.04365*R2)**2))*(1 + S/H)$

T = TOP DIAMETER ; D = DBHCE ; E2 = 0.152 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2768 TREES FROM NFLD., N.B., QUE., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 EASTERN WHITE CEDAR / THUJA OCCIDENTALIS L.

CBH08 CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.015	0.025	0.032	0.034	0.036	0.038	0.039	0.041	0.103	0.111
12	0.026	0.043	0.055	0.057	0.061	0.064	0.067	0.070	0.140	0.150
14	0.039	0.064	0.081	0.084	0.089	0.094	0.098	0.102	0.181	0.194
16	0.052	0.086	0.109	0.113	0.120	0.127	0.132	0.137	0.226	0.243
18		0.111	0.141	0.146	0.155	0.163	0.171	0.177	0.275	0.296
20		0.139	0.176	0.183	0.194	0.204	0.213	0.222	0.329	0.354
22		0.169	0.215	0.223	0.237	0.249	0.260	0.271	0.388	0.417
24		0.202	0.258	0.267	0.283	0.298	0.312	0.324	0.451	0.485
26			0.304	0.314	0.334	0.351	0.367	0.381	0.519	0.558
28			0.353	0.365	0.388	0.409	0.427	0.444	0.592	0.636
30			0.406	0.420	0.447	0.470	0.491	0.510	0.669	0.719
32			0.463	0.479	0.509	0.536	0.560	0.582	0.751	0.807
34			0.523	0.542	0.576	0.606	0.633	0.658	0.829	0.900
36			0.587	0.608	0.646	0.680	0.710	0.738	0.913	0.998
38			0.655	0.678	0.720	0.758	0.792	0.823	1.024	1.101
40			0.726	0.752	0.799	0.841	0.879	0.913	1.125	1.209
42			0.801	0.830	0.881	0.928	0.969	1.007	1.230	1.322
44			0.880	0.911	0.968	1.019	1.064	1.106	1.340	1.440
46			0.962	0.996	1.058	1.114	1.168	1.217	1.454	1.563
48		1.048	1.048	1.085	1.153	1.213	1.268	1.317	1.573	1.691
50			1.178	1.178	1.251	1.317	1.376	1.429	1.697	1.824
52			1.274	1.274	1.354	1.425	1.489	1.546	1.826	1.962
54			1.374	1.374	1.460	1.537	1.606	1.668	1.959	2.105
56			1.478	1.478	1.571	1.653	1.727	1.794	2.097	2.253
58						1.774	1.853	1.925	2.239	2.407
60						1.858	1.984	2.061	2.386	2.565
62						2.028	2.119	2.201	2.538	2.728
64						2.161	2.258	2.345	2.695	2.896
66							2.401	2.495	2.807	3.069
68							2.549	2.648	3.022	3.247
70							2.702	2.807	3.137	3.431
72							2.859	2.970		
74							3.020	3.137		

EQUATION: $VM = V*(R1 + R2*X3 + R3*X3*X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9645 ; R2 = -0.1616 ; R3 = -0.7945

$X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)$

T = TOP DIAMETER ; D = CBH08 ; B2 = 0.155 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 187 TREES FROM QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 EASTERN HEMLOCK / TSUGA CANADENSIS (L.) CARR.

DBHOB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.025	0.036	0.038	0.042	0.046	0.050	0.053	0.137	0.158
12	0.022	0.043	0.062	0.065	0.072	0.079	0.085	0.091	0.186	0.214
14	0.033	0.063	0.090	0.095	0.105	0.115	0.124	0.133	0.240	0.277
16	0.044	0.085	0.122	0.129	0.142	0.155	0.168	0.180	0.300	0.346
18		0.110	0.157	0.166	0.183	0.200	0.217	0.232	0.366	0.422
20		0.137	0.196	0.207	0.229	0.250	0.271	0.290	0.438	0.505
22		0.167	0.239	0.253	0.280	0.305	0.330	0.354	0.516	0.594
24		0.200	0.286	0.303	0.335	0.365	0.395	0.424	0.600	0.691
26			0.337	0.367	0.394	0.430	0.465	0.499	0.690	0.795
28			0.392	0.415	0.459	0.501	0.541	0.581	0.787	0.907
30			0.451	0.477	0.528	0.576	0.623	0.668	0.889	1.025
32			0.515	0.544	0.601	0.657	0.710	0.762	0.998	1.150
34			0.582	0.615	0.680	0.742	0.803	0.866	1.113	1.283
36			0.653	0.690	0.763	0.833	0.901	0.966	1.234	1.423
38			0.728	0.770	0.851	0.929	1.005	1.078	1.362	1.569
40			0.807	0.854	0.943	1.030	1.114	1.195	1.495	1.723
42			0.891	0.942	1.041	1.136	1.229	1.318	1.635	1.884
44			0.978	1.034	1.143	1.248	1.349	1.448	1.781	2.053
46			1.070	1.131	1.250	1.365	1.476	1.583	1.933	2.228
48			1.165	1.232	1.361	1.486	1.607	1.724	2.092	2.410
50				1.337	1.478	1.613	1.745	1.871	2.256	2.600
52				1.446	1.599	1.746	1.888	2.025	2.427	2.797
54				1.560	1.724	1.883	2.036	2.184	2.604	3.001
56				1.678	1.855	2.025	2.190	2.349	2.787	3.212
58						2.173	2.350	2.521	2.977	3.430
62						2.326	2.515	2.698	3.172	3.656
64						2.484	2.686	2.882	3.374	3.888
66						2.647	2.863	3.071	3.582	4.128
68							3.045	3.266	3.797	4.375
70							3.233	3.468	4.017	4.629
72							3.426	3.675	4.244	
74							3.625	3.888		
							3.829	4.108		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9645 ; R2 = -0.1616 ; R3 = -0.7945

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = DBHOB ; B2 = 0.155 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 383 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 TREMBLING ASPEN / POPULUS TREMULCIDES MICHX.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.011	0.023	0.035	0.038	0.042	0.047	0.053	0.058	0.150	0.182
12	0.020	0.040	0.060	0.065	0.073	0.082	0.090	0.099	0.202	0.245
14	0.029	0.058	0.088	0.094	0.106	0.119	0.131	0.144	0.322	0.391
16	0.038	0.078	0.118	0.126	0.143	0.159	0.176	0.193	0.466	0.567
18		0.100	0.152	0.162	0.183	0.205	0.226	0.248	0.636	0.773
20		0.124	0.188	0.201	0.228	0.254	0.281	0.308	0.831	1.010
22		0.151	0.229	0.245	0.277	0.309	0.342	0.374	0.938	1.140
24		0.180	0.273	0.292	0.330	0.369	0.407	0.447	1.052	1.278
26			0.321	0.343	0.388	0.433	0.479	0.525	1.172	1.424
28			0.372	0.398	0.450	0.503	0.556	0.609	1.299	1.578
30			0.428	0.457	0.517	0.577	0.638	0.699	1.432	1.740
32			0.487	0.520	0.588	0.657	0.726	0.796	1.571	1.909
34			0.545	0.587	0.664	0.742	0.820	0.899	1.717	2.086
36			0.616	0.659	0.745	0.831	0.919	1.007	1.869	2.272
38			0.686	0.734	0.829	0.926	1.024	1.122	2.028	2.465
40			0.760	0.813	0.919	1.026	1.134	1.244	2.194	2.666
42			0.838	0.896	1.013	1.131	1.251	1.371	2.365	2.874
44			0.920	0.984	1.112	1.241	1.372	1.505	2.544	3.091
46			1.005	1.075	1.215	1.357	1.500	1.644	2.729	3.315
48			1.094	1.170	1.323	1.477	1.633	1.790	2.920	3.548
50				1.270	1.435	1.603	1.772	1.942	3.117	3.788
52				1.373	1.552	1.733	1.916	2.101	3.322	4.036
54				1.481	1.674	1.869	2.066	2.265	3.532	4.292
56				1.592	1.800	2.010	2.222	2.436	3.749	4.556
58						2.156	2.383	2.613	4.025	5.107
60						2.307	2.550	2.796	4.440	5.395
62						2.463	2.723	2.985		
64						2.625	2.901	3.181		
66							3.085	3.383		
68							3.275	3.590		
70							3.470	3.805		
72							3.671	4.025		
74							3.878	4.252		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$
 WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9354 ; R2 = 0.0957 ; R3 = -1.1613
 $X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S / H)$
 T = TOP DIAMETER ; D = DBHOE ; B2 = 0.127 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT
 DATA SOURCE: 800 TREES FROM QUE., CNT., MAN., SASK.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TCP DIAMETER INSIDE BARK = 7.0 CM)
 BALSAM POPLAR / POPULUS BALSAMIFERA L.

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.042	0.047	0.051	0.055	0.144	0.170
12	0.021	0.042	0.061	0.065	0.073	0.081	0.088	0.095	0.193	0.228
14	0.031	0.060	0.089	0.095	0.106	0.117	0.128	0.136	0.248	0.293
16	0.041	0.081	0.120	0.127	0.142	0.157	0.172	0.186	0.308	0.364
18		0.104	0.154	0.163	0.183	0.202	0.220	0.239	0.375	0.442
20		0.130	0.191	0.203	0.227	0.251	0.274	0.297	0.447	0.528
22		0.157	0.232	0.247	0.276	0.305	0.333	0.361	0.525	0.620
24		0.188	0.277	0.294	0.346	0.427	0.467	0.506	0.609	0.720
26			0.325	0.378	0.402	0.495	0.541	0.587	0.700	0.826
28			0.434	0.461	0.515	0.569	0.622	0.674	0.796	0.941
30			0.494	0.525	0.587	0.647	0.708	0.767	0.899	1.062
32			0.557	0.593	0.662	0.731	0.799	0.866	1.008	1.190
34			0.625	0.664	0.742	0.820	0.896	0.971	1.123	1.326
36			0.696	0.740	0.827	0.913	0.998	1.082	1.244	1.469
38			0.771	0.820	0.916	1.002	1.086	1.169	1.372	1.620
40			0.850	0.904	1.010	1.115	1.219	1.321	1.535	1.778
42			0.933	0.992	1.109	1.224	1.338	1.450	1.665	1.943
44			1.020	1.084	1.212	1.338	1.462	1.584	1.805	2.115
46			1.110	1.180	1.319	1.456	1.591	1.725	1.943	2.295
48				1.281	1.431	1.580	1.727	1.872	2.082	2.482
50				1.385	1.548	1.709	1.867	2.024	2.266	2.677
52				1.494	1.669	1.843	2.014	2.183	2.437	2.878
54				1.606	1.795	1.981	2.165	2.347	2.614	3.087
56						2.125	2.323	2.518	2.797	3.304
58						2.274	2.486	2.694	2.987	3.527
60						2.428	2.654	2.876	3.182	3.758
62						2.587	2.828	3.065	3.384	3.997
64							3.007	3.259	3.592	4.242
66							3.192	3.460	3.806	4.495
68							3.382	3.666	4.027	4.756
70							3.578	3.878	4.253	
72							3.779	4.096		
74										

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9354 ; R2 = 0.0957 ; R3 = -1.1613

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = CBFOB ; B2 = 0.127 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 2421 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 WHITE BIRCH / BETULA PAPERIFERA MARSH.

DBH/DB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.033	0.034	0.037	0.040	0.043	0.045	0.115	0.128
12	0.022	0.040	0.055	0.058	0.063	0.068	0.072	0.076	0.156	0.174
14	0.033	0.059	0.081	0.085	0.092	0.099	0.106	0.112	0.202	0.226
16	0.045	0.081	0.110	0.115	0.126	0.135	0.144	0.152	0.253	0.283
18		0.104	0.143	0.150	0.163	0.175	0.186	0.197	0.310	0.346
20		0.131	0.179	0.188	0.204	0.219	0.234	0.247	0.372	0.415
22		0.160	0.219	0.229	0.249	0.268	0.286	0.302	0.439	0.489
24		0.192	0.263	0.275	0.325	0.322	0.343	0.362	0.511	0.570
26			0.310	0.325	0.378	0.380	0.404	0.427	0.588	0.657
28			0.416	0.436	0.474	0.442	0.471	0.498	0.760	0.847
30			0.537	0.563	0.540	0.509	0.542	0.574	0.853	0.952
32			0.603	0.632	0.612	0.581	0.619	0.654	0.952	1.062
34			0.673	0.705	0.687	0.657	0.700	0.740	1.056	1.178
36			0.746	0.782	0.766	0.738	0.786	0.828	1.166	1.301
38			0.824	0.863	0.850	0.824	0.877	0.928	1.280	1.429
40			0.905	0.948	0.938	0.914	0.973	1.029	1.401	1.563
42			0.990	1.037	1.028	1.009	1.074	1.136	1.526	1.703
44			1.079	1.130	1.128	1.212	1.291	1.365	1.657	1.849
46				1.130	1.229	1.321	1.407	1.488	1.793	2.001
48				1.227	1.334	1.434	1.527	1.615	1.935	2.159
50				1.328	1.444	1.552	1.653	1.748	2.082	2.323
52				1.433	1.558	1.674	1.783	1.886	2.234	2.492
54				1.542	1.676	1.801	1.919	2.029	2.391	2.668
56						1.933	2.059	2.177	2.554	2.850
58						2.069	2.204	2.331	2.722	3.037
60						2.210	2.354	2.490	2.896	3.231
62						2.356	2.509	2.654	3.075	3.431
64						2.669	2.834	2.997	3.259	3.636
66						2.834	3.004	3.177	3.449	3.848
68						3.004	3.179	3.361	3.644	4.065
70						3.179	3.358	3.551		
72						3.358				
74										

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$
 WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9087 ; R2 = -0.3049 ; R3 = -0.5107
 $X3 = (T * T / (D * D * ((1 - 0.04365 * R2) * 2))) * (1 + S / H)$
 T = TOP DIAMETER ; D = DBHOB ; B2 = 0.176 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT
 DATA SOURCE: 1272 TREES FROM QUE., ONT., ALTA.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.012	0.022	0.032	0.034	0.037	0.040	0.043	0.046	0.117	0.134
12	0.020	0.038	0.054	0.057	0.062	0.068	0.073	0.078	0.159	0.181
14	0.029	0.055	0.078	0.083	0.091	0.099	0.106	0.114	0.205	0.234
16	0.040	0.075	0.106	0.112	0.123	0.134	0.144	0.154	0.257	0.293
18		0.097	0.137	0.145	0.159	0.173	0.186	0.199	0.313	0.358
20		0.121	0.172	0.181	0.199	0.216	0.233	0.249	0.375	0.429
22		0.148	0.209	0.221	0.243	0.264	0.283	0.304	0.443	0.505
24		0.177	0.251	0.265	0.291	0.317	0.341	0.364	0.515	0.588
26			0.296	0.312	0.343	0.373	0.402	0.429	0.593	0.677
28			0.345	0.363	0.400	0.435	0.468	0.500	0.677	0.773
30			0.397	0.418	0.460	0.500	0.539	0.576	0.765	0.874
32			0.452	0.477	0.525	0.571	0.614	0.656	0.859	0.981
34			0.512	0.540	0.594	0.645	0.695	0.742	1.064	1.214
36			0.575	0.606	0.667	0.725	0.780	0.834	1.174	1.340
38			0.641	0.676	0.744	0.809	0.871	0.930	1.289	1.471
40			0.711	0.750	0.825	0.897	0.966	1.032	1.410	1.609
42			0.785	0.827	0.910	0.990	1.066	1.138	1.536	1.753
44			0.862	0.909	1.000	1.087	1.170	1.250	1.668	1.904
46			0.943	0.994	1.094	1.189	1.280	1.368	1.805	2.060
48			1.027	1.083	1.191	1.295	1.395	1.490	1.947	2.222
50				1.176	1.294	1.406	1.514	1.617	2.094	2.391
52				1.272	1.400	1.522	1.638	1.750	2.247	2.565
54				1.373	1.510	1.642	1.768	1.888	2.406	2.746
56				1.477	1.625	1.766	1.902	2.031	2.569	2.933
58						1.895	2.040	2.180	2.739	3.126
60						2.029	2.184	2.333	2.913	3.325
62						2.167	2.333	2.492	3.093	3.530
64						2.309	2.486	2.656	3.278	3.742
66							2.645	2.825	3.469	3.959
68							2.808	3.000	3.664	4.183
70							2.976	3.179		
72							3.149	3.364		
74							3.327	3.554		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.8778 ; R2 = -0.2417 ; R3 = -0.5247

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = CBH@B ; B2 = 0.181 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 1733 TREES FROM QUE., ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 MAPLE / ACER L.

DBHOB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.012		0.032	0.034	0.038	0.042	0.045	0.048		
12	0.020	0.022	0.055	0.058	0.064	0.071	0.076	0.082		0.143
14	0.029	0.038	0.080	0.085	0.094	0.103	0.111	0.120	0.124	0.193
16	0.039	0.075	0.108	0.114	0.126	0.138	0.150	0.161	0.167	0.248
18		0.096	0.135	0.147	0.163	0.178	0.193	0.207	0.214	0.310
20		0.120	0.173	0.183	0.203	0.222	0.241	0.259	0.268	0.377
22		0.146	0.211	0.223	0.247	0.270	0.293	0.315	0.326	0.451
24		0.175	0.252	0.267	0.295	0.323	0.350	0.376	0.389	0.531
26			0.297	0.314	0.348	0.380	0.412	0.443	0.458	0.617
28			0.345	0.365	0.404	0.442	0.479	0.515	0.533	0.709
30			0.396	0.419	0.465	0.508	0.551	0.592	0.612	0.808
32			0.451	0.478	0.529	0.579	0.628	0.675	0.698	0.912
34			0.510	0.540	0.598	0.654	0.709	0.762	0.788	1.024
36			0.572	0.606	0.671	0.734	0.796	0.855	0.884	1.141
38			0.638	0.675	0.748	0.819	0.887	0.953	0.986	1.265
40			0.707	0.749	0.829	0.907	0.983	1.057	1.093	1.395
42			0.780	0.826	0.915	1.001	1.084	1.166	1.205	1.532
44			0.857	0.906	1.004	1.099	1.191	1.280	1.323	1.675
46			0.936	0.991	1.098	1.201	1.302	1.399	1.447	1.824
48			1.020	1.079	1.196	1.308	1.418	1.524	1.576	1.980
50				1.171	1.298	1.420	1.538	1.654	1.710	2.142
52				1.267	1.404	1.536	1.664	1.789	1.850	2.310
54				1.367	1.514	1.657	1.795	1.929	1.995	2.484
56				1.470	1.628	1.782	1.931	2.075	2.146	2.665
58						1.912	2.071	2.226	2.302	2.853
60						2.046	2.217	2.383	2.464	3.046
62						2.185	2.367	2.545	2.631	3.246
64						2.328	2.523	2.712	2.804	3.453
66							2.683	2.884	2.982	3.665
68							2.848	3.062	3.166	3.884
70							3.019	3.245	3.355	4.110
72							3.194	3.433	3.550	4.341
74							3.374	3.626	3.750	

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$
 WHERE: VM = MERCHANTABLE VOLUME; V = TCTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375
 $X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S / H)$
 T = TOP DIAMETER ; D = DBHOB ; E2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT
 DATA SOURCE: 3567 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

BASSWOOD

/ TILIA AMERICANA L.

DBH/CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.011	0.022	0.031	0.033	0.037	0.041	0.044	0.047	0.121	0.141
12	0.019	0.037	0.052	0.057	0.063	0.069	0.075	0.081	0.117	0.190
14	0.028	0.054	0.078	0.082	0.091	0.100	0.109	0.117	0.163	0.244
16	0.037	0.072	0.105	0.111	0.123	0.135	0.147	0.158	0.210	0.305
18		0.093	0.135	0.143	0.159	0.174	0.189	0.203	0.262	0.371
20		0.116	0.168	0.178	0.198	0.217	0.235	0.253	0.319	0.444
22		0.141	0.205	0.217	0.241	0.264	0.287	0.309	0.382	0.522
24		0.169	0.245	0.259	0.288	0.316	0.343	0.369	0.449	0.607
26			0.288	0.305	0.339	0.371	0.403	0.434	0.522	0.698
28			0.335	0.355	0.394	0.432	0.469	0.504	0.600	0.795
30			0.385	0.408	0.453	0.496	0.539	0.580	0.684	0.898
32			0.439	0.465	0.516	0.565	0.614	0.661	0.773	1.008
34			0.496	0.525	0.583	0.639	0.693	0.747	0.867	1.123
36			0.556	0.589	0.654	0.717	0.778	0.838	0.966	1.245
38			0.620	0.657	0.728	0.799	0.867	0.934	1.071	1.373
40			0.687	0.728	0.808	0.886	0.961	1.035	1.182	1.508
42			0.758	0.803	0.891	0.977	1.060	1.142	1.297	1.648
44			0.832	0.882	0.978	1.073	1.164	1.253	1.418	1.795
46			0.910	0.964	1.070	1.173	1.273	1.370	1.545	1.948
48			0.991	1.050	1.165	1.277	1.386	1.492	1.676	2.108
50				1.139	1.264	1.386	1.504	1.620	1.813	2.273
52				1.233	1.368	1.499	1.627	1.752	1.956	2.445
54				1.329	1.475	1.617	1.755	1.890	2.104	2.623
56				1.430	1.587	1.739	1.888	2.033	2.257	2.807
58					1.697	1.866	2.025	2.181	2.415	2.998
60					1.833	1.997	2.168	2.334	2.579	3.195
62					1.973	2.133	2.315	2.492	2.749	3.398
64					2.117	2.273	2.467	2.656	2.923	3.607
66					2.265	2.417	2.624	2.825	3.103	3.823
68					2.417	2.562	2.785	2.999	3.289	4.044
70					2.573	2.713	2.952	3.178	3.480	4.272
72					2.733	2.863	3.123	3.362	3.676	
74					2.897	3.017	3.299	3.552		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 140 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TCP DIAMETER INSIDE BARK = 7.0 CM)
 BEECH / FAGUS GRANDIFOLIA EHRH.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.026	0.037	0.039	0.043	0.047	0.051	0.055	0.140	0.162
12	0.023	0.044	0.063	0.066	0.073	0.080	0.087	0.093	0.189	0.219
14	0.033	0.063	0.123	0.096	0.107	0.117	0.126	0.136	0.244	0.282
16	0.045	0.085	0.158	0.130	0.144	0.157	0.170	0.183	0.304	0.351
18		0.110	0.197	0.167	0.185	0.203	0.219	0.236	0.370	0.428
20		0.137	0.240	0.209	0.231	0.253	0.274	0.294	0.442	0.511
22		0.167	0.287	0.304	0.336	0.368	0.398	0.428	0.521	0.602
24		0.200	0.338	0.358	0.396	0.433	0.469	0.504	0.605	0.699
26			0.393	0.416	0.460	0.503	0.545	0.585	0.696	0.804
28			0.452	0.478	0.529	0.579	0.627	0.673	0.792	0.916
30			0.515	0.544	0.603	0.659	0.714	0.767	0.895	1.035
32			0.582	0.615	0.681	0.745	0.806	0.866	1.005	1.161
34			0.652	0.690	0.764	0.835	0.905	0.972	1.120	1.295
36			0.727	0.769	0.852	0.931	1.009	1.083	1.242	1.435
38			0.806	0.853	0.944	1.033	1.118	1.201	1.369	1.583
40			0.889	0.941	1.041	1.139	1.233	1.325	1.503	1.738
42			0.976	1.033	1.143	1.250	1.354	1.454	1.644	1.900
44			1.067	1.129	1.250	1.367	1.480	1.590	1.790	2.069
46			1.162	1.230	1.361	1.489	1.612	1.732	1.943	2.246
48				1.335	1.477	1.616	1.750	1.879	2.102	2.429
50				1.444	1.598	1.748	1.893	2.033	2.267	2.620
52				1.557	1.724	1.885	2.041	2.193	2.438	2.818
54				1.675	1.854	2.028	2.196	2.358	2.616	3.024
56						2.208	2.355	2.530	2.799	3.236
58						2.328	2.521	2.708	2.989	3.456
60						2.486	2.692	2.892	3.186	3.683
62						2.649	2.869	3.082	3.388	3.917
64							3.051	3.277	3.597	4.158
66							3.239	3.479	3.812	4.406
68							3.433	3.687	4.033	4.662
70							3.632	3.901	4.260	4.925
72							3.837	4.121		
74										

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = DBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 388 TREES FROM QNT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 BLACK CHERRY / PRUNUS SEROTINA EHRH.

DBH/DI CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.012	0.024	0.036	0.038	0.043	0.048	0.052	0.057	0.147	0.176
12	0.020	0.040	0.061	0.065	0.073	0.081	0.089	0.097	0.198	0.237
14	0.029	0.059	0.088	0.094	0.106	0.117	0.129	0.141	0.254	0.305
16	0.040	0.079	0.119	0.127	0.143	0.158	0.174	0.190	0.317	0.380
18		0.102	0.153	0.163	0.184	0.204	0.224	0.244	0.386	0.463
20		0.127	0.191	0.204	0.229	0.254	0.279	0.305	0.462	0.553
22		0.155	0.232	0.248	0.279	0.310	0.340	0.371	0.544	0.651
24		0.185	0.278	0.296	0.327	0.370	0.407	0.443	0.632	0.757
26			0.327	0.349	0.392	0.435	0.475	0.522	0.726	0.870
28			0.380	0.405	0.456	0.506	0.556	0.607	0.827	0.992
30			0.437	0.466	0.524	0.582	0.640	0.697	0.935	1.120
32			0.498	0.531	0.597	0.663	0.729	0.795	1.049	1.257
34			0.562	0.600	0.674	0.749	0.823	0.898	1.169	1.401
36			0.631	0.673	0.757	0.840	0.924	1.007	1.296	1.553
38			0.704	0.750	0.844	0.937	1.030	1.123	1.430	1.713
40			0.780	0.832	0.935	1.038	1.142	1.245	1.570	1.881
42			0.860	0.917	1.031	1.145	1.259	1.373	1.716	2.056
44			0.944	1.007	1.132	1.257	1.382	1.507	1.869	2.240
46			1.032	1.101	1.238	1.375	1.511	1.648	2.028	2.431
48			1.032	1.119	1.258	1.407	1.546	1.695	2.107	2.629
50			1.124	1.201	1.348	1.505	1.646	1.795	2.236	2.836
52				1.301	1.463	1.625	1.786	1.948	2.444	3.050
54				1.408	1.583	1.758	1.932	2.107	2.545	3.273
56				1.518	1.707	1.896	2.084	2.273	2.731	3.502
58				1.633	1.836	2.039	2.242	2.444	2.923	3.740
60						2.188	2.405	2.622	3.121	3.986
62						2.341	2.574	2.807	3.326	4.239
64						2.500	2.749	2.997	3.537	4.500
66						2.664	2.929	3.194	3.755	4.769
68							3.115	3.397	4.210	5.046
70							3.307	3.606	4.448	
72							3.505	3.821		
74							3.708	4.043		
							3.917	4.271		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S / H)$

T = TCP DIAMETER ; D = CBHOB ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 21 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)
 WHITE ELM / ULMUS AMERICANA L.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.010	0.020	0.030	0.032	0.035	0.039	0.043	0.046	0.118	0.139
12	0.018	0.035	0.051	0.054	0.060	0.066	0.072	0.078	0.159	0.187
14	0.026	0.050	0.074	0.078	0.087	0.096	0.105	0.114	0.205	0.240
16	0.035	0.068	0.100	0.106	0.118	0.130	0.142	0.153	0.255	0.300
18		0.087	0.128	0.136	0.152	0.167	0.182	0.197	0.311	0.365
20		0.109	0.160	0.170	0.189	0.209	0.227	0.246	0.371	0.436
22		0.133	0.195	0.207	0.231	0.254	0.277	0.300	0.437	0.514
24		0.159	0.233	0.247	0.276	0.303	0.331	0.358	0.508	0.597
26			0.274	0.291	0.324	0.357	0.390	0.421	0.584	0.686
28			0.318	0.338	0.377	0.415	0.453	0.490	0.665	0.782
30			0.366	0.389	0.433	0.477	0.521	0.563	0.752	0.884
32			0.417	0.443	0.494	0.544	0.593	0.641	0.843	0.991
34			0.471	0.500	0.558	0.614	0.670	0.725	0.940	1.105
36			0.528	0.561	0.626	0.689	0.752	0.813	1.042	1.225
38			0.589	0.633	0.698	0.768	0.838	0.907	1.150	1.351
40			0.653	0.693	0.773	0.852	0.929	1.005	1.262	1.483
42			0.720	0.765	0.853	0.940	1.025	1.108	1.380	1.622
44			0.791	0.840	0.936	1.032	1.125	1.217	1.503	1.766
46			0.864	0.918	1.024	1.128	1.230	1.330	1.631	1.917
48			0.941	1.000	1.115	1.228	1.339	1.449	1.764	2.074
50				1.085	1.210	1.333	1.454	1.572	1.903	2.236
52				1.174	1.309	1.442	1.573	1.701	2.046	2.406
54				1.266	1.412	1.555	1.696	1.835	2.196	2.581
56				1.362	1.519	1.673	1.824	1.973	2.350	2.762
58						1.795	1.957	2.117	2.510	2.949
60						1.921	2.095	2.266	2.675	3.143
62						2.051	2.237	2.420	2.845	3.343
64						2.186	2.384	2.578	3.020	3.549
66							2.535	2.742	3.200	3.761
68							2.691	2.911	3.264	3.979
70							2.852	3.085	3.577	4.203
72							3.018	3.264		
74							3.188	3.448		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$
 WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375
 $X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S/H)$
 T = TOP DIAMETER ; D = DBHOE ; E2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT
 DATA SOURCE: 62 TREES FROM ONT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

IRONWOOD / OSTRYA VIRGINIANA (MILL.) K. KOCH

DBHCE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.033	0.035	0.038	0.041	0.044	0.047	0.119	0.135
12	0.022	0.040	0.056	0.059	0.065	0.070	0.075	0.080	0.161	0.182
14	0.032	0.059	0.082	0.086	0.094	0.102	0.109	0.116	0.207	0.234
16	0.043	0.079	0.110	0.116	0.127	0.137	0.147	0.156	0.258	0.292
18		0.102	0.142	0.150	0.164	0.177	0.189	0.201	0.315	0.355
20		0.127	0.177	0.187	0.204	0.221	0.236	0.251	0.376	0.424
22		0.155	0.216	0.227	0.248	0.269	0.288	0.306	0.442	0.499
24		0.186	0.258	0.271	0.297	0.321	0.344	0.365	0.514	0.580
26			0.304	0.320	0.350	0.378	0.405	0.430	0.591	0.667
28			0.353	0.371	0.406	0.439	0.470	0.500	0.673	0.760
30			0.406	0.427	0.467	0.505	0.541	0.575	0.761	0.859
32			0.463	0.486	0.532	0.570	0.616	0.655	0.854	0.964
34			0.523	0.550	0.601	0.650	0.696	0.740	0.952	1.074
36			0.586	0.617	0.674	0.729	0.781	0.830	1.055	1.191
38			0.654	0.687	0.752	0.813	0.871	0.925	1.164	1.313
40			0.723	0.762	0.834	0.901	0.965	1.026	1.278	1.442
42			0.799	0.841	0.919	0.994	1.065	1.132	1.397	1.576
44			0.878	0.923	1.009	1.091	1.169	1.242	1.521	1.717
46			0.960	1.009	1.103	1.193	1.278	1.358	1.651	1.863
48			1.045	1.099	1.202	1.299	1.392	1.479	1.786	2.016
50				1.192	1.304	1.410	1.510	1.605	1.926	2.174
52				1.290	1.411	1.525	1.634	1.737	2.072	2.338
54				1.391	1.522	1.645	1.762	1.873	2.223	2.509
56				1.497	1.637	1.770	1.895	2.015	2.379	2.685
58						1.898	2.033	2.161	2.541	2.867
60						2.032	2.176	2.313	2.707	3.055
62						2.170	2.324	2.470	2.879	3.250
64						2.312	2.476	2.632	3.057	3.450
66							2.634	2.800	3.150	3.656
68							2.796	2.972	3.239	3.868
70							3.033	3.150	3.427	4.086
72							3.312	3.332	3.621	
74								3.520		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T * (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBHCE ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

DATA SOURCE: 147 TREES FROM CNT.

MERCHANTABLE VOLUME (CUBIC METRES)

(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

RED OAK / QUERCUS RUBRA L.

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.013	0.024	0.034	0.036	0.040	0.043	0.046	0.050	0.126	0.144
12	0.022	0.041	0.058	0.061	0.068	0.073	0.079	0.084	0.170	0.194
14	0.032	0.060	0.085	0.089	0.098	0.107	0.115	0.122	0.219	0.249
16	0.043	0.081	0.114	0.120	0.132	0.144	0.155	0.165	0.273	0.311
18		0.104	0.147	0.155	0.170	0.185	0.199	0.212	0.322	0.378
20		0.130	0.183	0.193	0.212	0.231	0.248	0.265	0.397	0.452
22		0.158	0.223	0.235	0.259	0.281	0.302	0.322	0.467	0.532
24		0.189	0.267	0.281	0.309	0.336	0.361	0.385	0.543	0.619
26			0.314	0.331	0.354	0.395	0.425	0.454	0.625	0.711
28			0.365	0.385	0.423	0.459	0.494	0.527	0.712	0.810
30			0.420	0.443	0.486	0.528	0.568	0.606	0.804	0.915
32			0.478	0.504	0.554	0.602	0.647	0.691	0.902	1.027
34			0.541	0.570	0.626	0.680	0.731	0.780	1.006	1.145
36			0.607	0.639	0.702	0.763	0.820	0.875	1.115	1.269
38			0.676	0.713	0.783	0.850	0.914	0.976	1.230	1.400
40			0.750	0.790	0.868	0.943	1.014	1.082	1.350	1.537
42			0.827	0.871	0.957	1.040	1.118	1.193	1.476	1.680
44			0.908	0.956	1.051	1.141	1.228	1.310	1.607	1.830
46			0.992	1.046	1.149	1.248	1.342	1.432	1.744	1.986
48			1.081	1.139	1.252	1.359	1.462	1.560	1.887	2.149
50				1.236	1.358	1.475	1.586	1.693	2.035	2.317
52				1.337	1.469	1.595	1.716	1.831	2.189	2.493
54				1.442	1.585	1.721	1.851	1.975	2.348	2.674
56				1.551	1.705	1.851	1.991	2.124	2.513	2.862
58						1.986	2.136	2.279	2.684	3.056
60						2.125	2.286	2.439	2.860	3.257
62						2.269	2.441	2.605	3.042	3.464
64						2.418	2.601	2.776	3.229	3.677
66							2.766	2.952	3.422	3.897
68							3.037	3.134	3.621	4.123
70							3.112	3.321	3.825	4.355
72							3.293	3.514		
74							3.478	3.712		

EQUATION: $VM = V * (R1 + R2 * X3 + R3 * X3 * X3)$

WHERE: VM = MERCHANTABLE VOLUME; V = TCTAL VOLUME; R1 = 0.9057 ; R2 = -0.0708 ; R3 = -0.8375

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * B2))) * (1 + S / H)$

T = TOP DIAMETER ; D = DBHOE ; B2 = 0.145 ; S = STUMP HEIGHT ; H = TCTAL HEIGHT

DATA SOURCE: 40 TREES FROM ONT.

APPENDIX III Ratio of Merchantable Volume to Total Volume

	PAGE
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Stump height 0.15 m length ratio of 5%	69
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Stump height 0.15 m top diameter inside bark 23.0 cm	75
Stump height 0.15 m top diameter inside bark 27.0 cm	76
Stump height 0.30 m top diameter inside bark 7.0 cm	77
Stump height 0.30 m top diameter inside bark 11.0 cm	78
Stump height 0.30 m top diameter inside bark 15.0 cm	79
Stump height 0.30 m top diameter inside bark 19.0 cm	80
Stump height 0.30 m top diameter inside bark 23.0 cm	81
Stump height 0.30 m top diameter inside bark 27.0 cm	82

VOLUME DISTRIBUTION OVER THE TREE STEM

- 1) Proportions of total stem volume determined for specified proportions of total tree height using the height-ratio method and the all species coefficients from Table 4.

<u>% Height</u>	<u>% Volume</u>
10	21.76
15	30.97
20	39.60
25	47.65
30	55.12
35	62.00
40	68.30
45	74.03
50	79.17
55	83.73
60	87.70
65	91.10
70	93.92
75	96.15
80	97.80
85	98.87
90	99.36
95	99.36

- 2) Proportions of total stem volume determined for specified ratios of top diameter inside bark to diameter breast height outside bark using the squared diameter ratio method and the all species coefficients from Table 5.

<u>Ratio</u>	<u>% Volume</u>
0.10	100.00
0.15	100.00
0.20	100.00
0.25	99.69
0.30	98.88
0.35	97.75
0.40	96.22
0.45	94.21
0.50	91.59
0.55	88.26
0.60	84.07
0.65	78.87
0.70	72.52
0.75	64.83
0.80	55.63
0.85	44.71
0.90	31.87
0.95	16.88

RATIO OF MERCHANTABLE VOLUME TO TCTAL VOLUME

(STUMP HEIGHT = 0.15 M)

TCTAL HEIGHT (M)

X1	5	10	15	16	18	20	22	24	25	30
.10	0.1387	0.1699	0.1805	0.1818	0.1840	0.1857	0.1872	0.1884	0.1889	0.1910
.15	0.2308	0.2621	0.2726	0.2739	0.2761	0.2779	0.2793	0.2805	0.2810	0.2832
.20	0.3171	0.3484	0.3589	0.3602	0.3624	0.3642	0.3656	0.3668	0.3673	0.3695
.25	0.3976	0.4288	0.4394	0.4407	0.4429	0.4446	0.4461	0.4473	0.4478	0.4499
.30	0.4723	0.5035	0.5140	0.5154	0.5176	0.5193	0.5208	0.5220	0.5225	0.5246
.35	0.5412	0.5724	0.5829	0.5842	0.5864	0.5882	0.5896	0.5908	0.5913	0.5935
.40	0.6042	0.6354	0.6459	0.6472	0.6494	0.6512	0.6527	0.6539	0.6544	0.6565
.45	0.6614	0.6926	0.7032	0.7045	0.7067	0.7084	0.7099	0.7111	0.7116	0.7137
.50	0.7128	0.7440	0.7546	0.7559	0.7581	0.7598	0.7613	0.7625	0.7630	0.7651
.55	0.7584	0.7896	0.8002	0.8015	0.8037	0.8054	0.8069	0.8081	0.8086	0.8107
.60	0.7982	0.8294	0.8399	0.8412	0.8434	0.8452	0.8467	0.8479	0.8484	0.8505
.65	0.8322	0.8634	0.8739	0.8752	0.8774	0.8792	0.8806	0.8818	0.8823	0.8845
.70	0.8603	0.8915	0.9020	0.9034	0.9056	0.9073	0.9088	0.9100	0.9105	0.9126
.75	0.8826	0.9138	0.9244	0.9257	0.9279	0.9296	0.9311	0.9323	0.9328	0.9349
.80	0.8991	0.9304	0.9409	0.9422	0.9444	0.9462	0.9476	0.9488	0.9493	0.9515
.85	0.9098	0.9411	0.9516	0.9529	0.9551	0.9569	0.9583	0.9595	0.9600	0.9622
.90	0.9147	0.9459	0.9565	0.9578	0.9600	0.9617	0.9632	0.9644	0.9649	0.9670

EQUATION: $VM/V = P2*(X1 - X12) + P3*(X1*X1 - X12*X12)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; P2 = 2.1331 ; P3 = -1.1631

X1 = HM/H ; X12 = S/H

HM = HEIGHT TO MERCHANTABLE LIMIT ; H = TOTAL HEIGHT

S = STUMP HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.30 M)

		TOTAL HEIGHT (M)										
X1		5	10	15	16	18	20	22	24	25	30	
.10	0.0779	0.1387	0.1595	0.1621	0.1665	0.1699	0.1728	0.1752	0.1762	0.1805		
.15	0.1700	0.2308	0.2516	0.2542	0.2586	0.2621	0.2649	0.2673	0.2684	0.2726		
.20	0.2563	0.3171	0.3379	0.3405	0.3449	0.3484	0.3512	0.3536	0.3547	0.3589		
.25	0.3368	0.3976	0.4184	0.4210	0.4254	0.4288	0.4317	0.4341	0.4352	0.4394		
.30	0.4115	0.4723	0.4931	0.4957	0.5000	0.5035	0.5064	0.5088	0.5098	0.5140		
.35	0.4803	0.5412	0.5619	0.5645	0.5689	0.5724	0.5752	0.5776	0.5787	0.5829		
.40	0.5433	0.6042	0.6249	0.6276	0.6319	0.6354	0.6383	0.6407	0.6417	0.6459		
.45	0.6006	0.6614	0.6822	0.6848	0.6891	0.6926	0.6955	0.6979	0.6989	0.7032		
.50	0.6520	0.7128	0.7336	0.7362	0.7405	0.7440	0.7469	0.7493	0.7503	0.7546		
.55	0.6976	0.7584	0.7792	0.7818	0.7861	0.7896	0.7925	0.7949	0.7959	0.8002		
.60	0.7373	0.7982	0.8189	0.8216	0.8259	0.8294	0.8323	0.8347	0.8357	0.8399		
.65	0.7713	0.8322	0.8529	0.8555	0.8599	0.8634	0.8662	0.8686	0.8697	0.8739		
.70	0.7995	0.8603	0.8811	0.8837	0.8880	0.8915	0.8944	0.8968	0.8978	0.9020		
.75	0.8218	0.8826	0.9034	0.9060	0.9104	0.9138	0.9167	0.9191	0.9202	0.9244		
.80	0.8383	0.8991	0.9199	0.9225	0.9269	0.9304	0.9332	0.9356	0.9367	0.9409		
.85	0.8490	0.9098	0.9306	0.9332	0.9376	0.9411	0.9439	0.9463	0.9474	0.9516		
.90	0.8539	0.9147	0.9355	0.9381	0.9424	0.9459	0.9488	0.9512	0.9522	0.9565		

EQUATION: $VM/V = P2*(X1 - X12) + P3*(X1*X1 - X12*X12)$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; P2 = 2.1331 ; P3 = -1.1631

X1 = HM/H ; X12 = S/H

HM = HEIGHT TO MERCHANTABLE LIMIT ; H = TOTAL HEIGHT

S = STUMP HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

CBHOB CLASS (CM)	5	10	15	16	18	20	22	24	25	30
10	0.6696	0.6768	0.6792	0.6794	0.6799	0.6803	0.6807	0.6809		
12	0.8021	0.8059	0.8071	0.8073	0.8075	0.8077	0.8079	0.8080		
14	0.8635	0.8657	0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
16	0.8958	0.8972	0.8977	0.8977	0.8978	0.8979	0.8980	0.8980	0.8980	0.8981
18		0.9155	0.9158	0.9159	0.9159	0.9160	0.9160	0.9161	0.9161	0.9162
20		0.9270	0.9272	0.9272	0.9273	0.9273	0.9274	0.9274	0.9274	0.9274
22		0.9346	0.9347	0.9348	0.9348	0.9348	0.9349	0.9349	0.9349	0.9349
24		0.9398	0.9400	0.9400	0.9400	0.9400	0.9401	0.9401	0.9401	0.9401
26			0.9437	0.9438	0.9438	0.9438	0.9438	0.9438	0.9438	0.9439
28			0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466
30			0.9487	0.9487	0.9487	0.9487	0.9487	0.9487	0.9488	0.9488
32			0.9504	0.9504	0.9504	0.9504	0.9504	0.9504	0.9504	0.9504
34			0.9517	0.9517	0.9517	0.9517	0.9517	0.9518	0.9518	0.9518
36			0.9528	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528	0.9528
38			0.9537	0.9537	0.9537	0.9537	0.9537	0.9537	0.9537	0.9537
40			0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9545
42			0.9550	0.9550	0.9551	0.9551	0.9551	0.9551	0.9551	0.9551
44			0.9556	0.9556	0.9556	0.9556	0.9556	0.9556	0.9556	0.9556
46			0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
48			0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9564
50			0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568	0.9568
52			0.9571	0.9571	0.9571	0.9571	0.9571	0.9571	0.9571	0.9571
54			0.9573	0.9573	0.9573	0.9573	0.9573	0.9573	0.9573	0.9573
56			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9575
58							0.9576	0.9576	0.9576	0.9576
60							0.9578	0.9578	0.9578	0.9578
62							0.9579	0.9579	0.9579	0.9579
64							0.9581	0.9581	0.9581	0.9581
66							0.9583	0.9583	0.9583	0.9583
68							0.9584	0.9584	0.9584	0.9584
70							0.9585	0.9585	0.9585	0.9585
72							0.9586	0.9586	0.9586	0.9586
74							0.9587	0.9587	0.9587	0.9587
							0.9588	0.9588	0.9588	0.9588

EQUATION: $VM/V = R1 + R2 * X3 + R3 * X3 * X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) ** 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = CBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 11.0 CM)

DBH/D CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
14	0.5266	0.5376	0.5412	0.5417	0.5424	0.5430	0.5435	0.5440	0.5441	0.5449
16	0.6869	0.6936	0.6959	0.6961	0.6966	0.6970	0.6973	0.6975	0.6976	0.6981
18		0.7805	0.7819	0.7821	0.7824	0.7827	0.7829	0.7830	0.7831	0.7834
20		0.8325	0.8335	0.8337	0.8339	0.8340	0.8342	0.8343	0.8343	0.8345
22		0.8657	0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
24		0.8878	0.8883	0.8884	0.8885	0.8886	0.8887	0.8887	0.8887	0.8889
26			0.9036	0.9036	0.9037	0.9038	0.9038	0.9039	0.9039	0.9040
28			0.9145	0.9146	0.9146	0.9147	0.9147	0.9148	0.9148	0.9149
30			0.9228	0.9227	0.9227	0.9228	0.9228	0.9228	0.9229	0.9229
32			0.9288	0.9288	0.9289	0.9289	0.9289	0.9290	0.9290	0.9290
34			0.9336	0.9336	0.9336	0.9337	0.9337	0.9337	0.9337	0.9338
36			0.9373	0.9374	0.9374	0.9374	0.9374	0.9375	0.9375	0.9375
38			0.9404	0.9404	0.9404	0.9404	0.9405	0.9405	0.9405	0.9405
40			0.9428	0.9428	0.9429	0.9429	0.9429	0.9429	0.9429	0.9429
42			0.9449	0.9449	0.9449	0.9449	0.9449	0.9449	0.9449	0.9450
44			0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466	0.9466
46			0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9480	0.9481
48			0.9492	0.9492	0.9492	0.9492	0.9492	0.9493	0.9493	0.9493
50			0.9503	0.9503	0.9503	0.9503	0.9503	0.9503	0.9503	0.9503
52			0.9512	0.9512	0.9512	0.9512	0.9512	0.9512	0.9512	0.9512
54			0.9519	0.9519	0.9519	0.9520	0.9520	0.9520	0.9520	0.9520
56			0.9526	0.9526	0.9526	0.9526	0.9526	0.9526	0.9527	0.9527
58						0.9532	0.9532	0.9533	0.9533	0.9533
60						0.9538	0.9538	0.9538	0.9538	0.9538
62						0.9543	0.9543	0.9543	0.9543	0.9543
64						0.9547	0.9547	0.9547	0.9547	0.9547
66						0.9551	0.9551	0.9551	0.9551	0.9551
68						0.9554	0.9554	0.9554	0.9554	0.9554
70						0.9557	0.9557	0.9557	0.9557	0.9557
72						0.9560	0.9560	0.9560	0.9560	0.9560
74						0.9563	0.9563	0.9563	0.9563	0.9563

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*(D*D*((1 - 0.04365*B2)*2)))/(1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 15.0 CM)

DBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
18			0.4447	0.4453	0.4462	0.4470	0.4476	0.4481	0.4484	0.4493
20	0.4402		0.6039	0.6043	0.6049	0.6054	0.6059	0.6062	0.6064	0.6070
22	0.7010		0.7032	0.7035	0.7039	0.7043	0.7046	0.7048	0.7049	0.7054
24	0.7666		0.7682	0.7684	0.7687	0.7690	0.7692	0.7694	0.7695	0.7698
26			0.8125	0.8126	0.8129	0.8131	0.8132	0.8134	0.8134	0.8137
28			0.8437	0.8438	0.8440	0.8442	0.8443	0.8444	0.8444	0.8446
30			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
32			0.8833	0.8833	0.8834	0.8835	0.8836	0.8837	0.8837	0.8838
34			0.8961	0.8961	0.8962	0.8963	0.8964	0.8964	0.8965	0.8966
36			0.9060	0.9061	0.9062	0.9062	0.9063	0.9063	0.9064	0.9064
38			0.9139	0.9139	0.9140	0.9141	0.9141	0.9141	0.9142	0.9142
40			0.9202	0.9202	0.9203	0.9203	0.9204	0.9204	0.9204	0.9205
42			0.9253	0.9253	0.9254	0.9254	0.9255	0.9255	0.9255	0.9255
44			0.9295	0.9295	0.9296	0.9296	0.9296	0.9297	0.9297	0.9297
46			0.9330	0.9330	0.9331	0.9331	0.9331	0.9331	0.9332	0.9332
48			0.9359	0.9360	0.9360	0.9360	0.9360	0.9361	0.9361	0.9361
50				0.9384	0.9385	0.9385	0.9385	0.9385	0.9385	0.9386
52				0.9406	0.9406	0.9406	0.9406	0.9406	0.9407	0.9407
54				0.9424	0.9424	0.9424	0.9424	0.9425	0.9425	0.9425
56				0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9441
58					0.9454	0.9454	0.9454	0.9454	0.9454	0.9454
60					0.9466	0.9466	0.9466	0.9466	0.9466	0.9466
62					0.9477	0.9477	0.9477	0.9477	0.9477	0.9477
64					0.9486	0.9486	0.9486	0.9486	0.9486	0.9486
66					0.9495	0.9495	0.9495	0.9495	0.9495	0.9495
68					0.9502	0.9502	0.9502	0.9502	0.9502	0.9502
70					0.9509	0.9509	0.9509	0.9509	0.9509	0.9509
72					0.9515	0.9515	0.9515	0.9515	0.9515	0.9515
74					0.9521	0.9521	0.9521	0.9521	0.9521	0.9521

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*(1 - 0.04365*B2)**2))*((1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 19.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
22			0.3749	0.3756	0.3767	0.3775	0.3782	0.3788	0.3791	0.3801
24			0.5300	0.5305	0.5313	0.5319	0.5324	0.5328	0.5330	0.5337
26			0.6345	0.6348	0.6354	0.6359	0.6363	0.6366	0.6367	0.6373
28			0.7073	0.7076	0.7080	0.7084	0.7087	0.7089	0.7090	0.7094
30			0.7596	0.7598	0.7601	0.7604	0.7606	0.7608	0.7609	0.7612
32			0.7580	0.7582	0.7584	0.7587	0.7588	0.7590	0.7591	0.7593
34			0.8269	0.8271	0.8273	0.8274	0.8276	0.8277	0.8278	0.8280
36			0.8491	0.8492	0.8494	0.8495	0.8496	0.8497	0.8498	0.8500
38			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
40			0.8801	0.8802	0.8803	0.8804	0.8805	0.8806	0.8807	0.8807
42			0.8911	0.8912	0.8913	0.8913	0.8914	0.8915	0.8915	0.8916
44			0.9000	0.9001	0.9002	0.9003	0.9003	0.9004	0.9004	0.9005
46			0.9074	0.9075	0.9075	0.9076	0.9077	0.9077	0.9077	0.9078
48			0.9135	0.9136	0.9136	0.9137	0.9137	0.9138	0.9138	0.9139
50				0.9187	0.9188	0.9188	0.9189	0.9189	0.9189	0.9190
52				0.9230	0.9231	0.9231	0.9232	0.9232	0.9232	0.9233
54				0.9268	0.9268	0.9268	0.9268	0.9269	0.9269	0.9270
56				0.9299	0.9300	0.9300	0.9300	0.9301	0.9301	0.9301
58					0.9328	0.9328	0.9328	0.9328	0.9328	0.9329
60					0.9352	0.9352	0.9352	0.9352	0.9352	0.9352
62					0.9372	0.9372	0.9372	0.9373	0.9373	0.9373
64					0.9391	0.9391	0.9391	0.9391	0.9391	0.9392
66					0.9407	0.9407	0.9407	0.9407	0.9408	0.9408
68					0.9422	0.9422	0.9422	0.9422	0.9422	0.9422
70					0.9435	0.9435	0.9435	0.9435	0.9435	0.9435
72					0.9446	0.9446	0.9446	0.9446	0.9446	0.9447
74					0.9457	0.9457	0.9457	0.9457	0.9457	0.9457

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*T/(D*D*((1 - 0.04365*E2)**2)))*(1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; E2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 23.0 CM)

DBHOE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
26			0.3225	0.3232	0.3244	0.3253	0.3261	0.3267	0.3270	0.3281
28			0.4703	0.4709	0.4718	0.4725	0.4731	0.4735	0.4738	0.4746
30			0.5756	0.5761	0.5767	0.5773	0.5777	0.5781	0.5783	0.5790
32			0.6526	0.6529	0.6534	0.6539	0.6542	0.6545	0.6546	0.6552
34			0.7100	0.7102	0.7107	0.7110	0.7113	0.7115	0.7116	0.7121
36			0.7537	0.7539	0.7542	0.7545	0.7547	0.7549	0.7550	0.7554
38			0.7875	0.7877	0.7879	0.7882	0.7884	0.7885	0.7886	0.7889
40			0.8141	0.8142	0.8145	0.8147	0.8148	0.8150	0.8150	0.8152
42			0.8353	0.8354	0.8356	0.8358	0.8359	0.8360	0.8361	0.8363
44			0.8524	0.8525	0.8527	0.8528	0.8529	0.8530	0.8531	0.8532
46			0.8664	0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
48			0.8779	0.8780	0.8781	0.8782	0.8783	0.8784	0.8784	0.8785
50				0.8876	0.8877	0.8878	0.8879	0.8879	0.8880	0.8881
52				0.8957	0.8958	0.8958	0.8959	0.8960	0.8960	0.8961
54				0.9025	0.9026	0.9026	0.9027	0.9027	0.9028	0.9029
56				0.9083	0.9084	0.9085	0.9085	0.9086	0.9086	0.9086
58						0.9135	0.9135	0.9135	0.9136	0.9136
60						0.9178	0.9178	0.9178	0.9179	0.9179
62						0.9215	0.9216	0.9216	0.9216	0.9217
64						0.9248	0.9249	0.9249	0.9249	0.9249
66							0.9277	0.9278	0.9278	0.9278
68							0.9303	0.9303	0.9303	0.9303
70							0.9326	0.9326	0.9326	0.9326
72							0.9346	0.9346	0.9346	0.9346
74							0.9364	0.9364	0.9364	0.9364

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)$

T = TOP DIAMETER ; D = DBHOE ; E2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
 (STUMP HEIGHT = 0.15 M ; TOP DIAMETER INSIDE BARK = 27.0 CM)

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
30			0.2818	0.2825	0.2838	0.2848	0.2856	0.2863	0.2866	0.2878
32			0.4215	0.4221	0.4231	0.4239	0.4245	0.4251	0.4253	0.4262
34			0.5253	0.5258	0.5266	0.5272	0.5277	0.5281	0.5283	0.5291
36			0.6039	0.6043	0.6049	0.6054	0.6059	0.6062	0.6064	0.6070
38			0.6645	0.6648	0.6653	0.6657	0.6660	0.6663	0.6665	0.6670
40			0.7118	0.7121	0.7125	0.7128	0.7131	0.7134	0.7135	0.7139
42			0.7493	0.7496	0.7499	0.7502	0.7505	0.7507	0.7507	0.7511
44			0.7795	0.7797	0.7800	0.7802	0.7804	0.7806	0.7807	0.7810
46			0.8040	0.8041	0.8044	0.8046	0.8048	0.8049	0.8050	0.8052
48			0.8241	0.8242	0.8244	0.8246	0.8248	0.8249	0.8249	0.8252
50				0.8409	0.8410	0.8412	0.8413	0.8414	0.8415	0.8417
52				0.8548	0.8549	0.8551	0.8552	0.8553	0.8553	0.8555
54				0.8665	0.8666	0.8667	0.8668	0.8669	0.8670	0.8671
56				0.8764	0.8766	0.8767	0.8767	0.8768	0.8768	0.8770
58					0.8851	0.8851	0.8852	0.8853	0.8853	0.8854
60					0.8924	0.8924	0.8925	0.8926	0.8926	0.8927
62					0.8987	0.8987	0.8988	0.8989	0.8989	0.8990
64					0.9042	0.9042	0.9043	0.9043	0.9044	0.9044
66						0.9091	0.9091	0.9091	0.9092	0.9092
68						0.9133	0.9133	0.9134	0.9134	0.9134
70						0.9171	0.9171	0.9171	0.9171	0.9172
72						0.9204	0.9204	0.9204	0.9204	0.9205
74						0.9233	0.9233	0.9234	0.9234	0.9234

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*(1 - 0.04365*B2)*2))*((1 + S/H)$

T = TOP DIAMETER ; 0 = DBH@E ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 7.0 CM)

DBH CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
10	0.6549	0.6696	0.6744	0.6750	0.6760	0.6768	0.6774	0.6780	0.8661	0.8664
12	0.7945	0.8021	0.8046	0.8049	0.8055	0.8059	0.8062	0.8065	0.8975	0.8977
14	0.8590	0.8635	0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.9157	0.9158
16	0.8930	0.8958	0.8967	0.8969	0.8970	0.8972	0.8973	0.8974	0.9271	0.9272
18		0.9146	0.9152	0.9153	0.9154	0.9155	0.9156	0.9157	0.9347	0.9347
20		0.9263	0.9268	0.9268	0.9269	0.9270	0.9270	0.9271	0.9399	0.9400
22		0.9341	0.9344	0.9344	0.9345	0.9346	0.9346	0.9347	0.9437	0.9437
24		0.9395	0.9397	0.9397	0.9397	0.9398	0.9399	0.9399	0.9465	0.9466
26			0.9435	0.9436	0.9436	0.9436	0.9437	0.9437	0.9487	0.9487
28			0.9464	0.9464	0.9464	0.9465	0.9465	0.9465	0.9504	0.9504
30			0.9486	0.9486	0.9486	0.9486	0.9487	0.9487	0.9517	0.9517
32			0.9503	0.9503	0.9503	0.9503	0.9503	0.9504	0.9528	0.9528
34			0.9516	0.9516	0.9516	0.9517	0.9517	0.9517	0.9537	0.9537
36			0.9527	0.9527	0.9527	0.9527	0.9528	0.9528	0.9544	0.9544
38			0.9536	0.9536	0.9536	0.9536	0.9537	0.9537	0.9550	0.9550
40			0.9544	0.9544	0.9544	0.9544	0.9544	0.9544	0.9556	0.9556
42			0.9550	0.9550	0.9550	0.9550	0.9550	0.9550	0.9560	0.9560
44			0.9555	0.9555	0.9555	0.9555	0.9556	0.9556	0.9564	0.9564
46			0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9567	0.9567
48			0.9564	0.9564	0.9564	0.9564	0.9564	0.9564	0.9570	0.9570
50			0.9567	0.9567	0.9567	0.9567	0.9567	0.9567	0.9573	0.9573
52			0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9575	0.9575
54			0.9573	0.9573	0.9573	0.9573	0.9573	0.9573	0.9577	0.9577
56			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9579	0.9579
58			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9581	0.9581
60			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9582	0.9582
62			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9584	0.9584
64			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9585	0.9585
66			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9586	0.9586
68			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9587	0.9587
70			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9588	0.9588
72			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9588	0.9588
74			0.9575	0.9575	0.9575	0.9575	0.9575	0.9575	0.9588	0.9588

EQUATION: $VM/V = R1 + R2 * X3 + R3 * X3 * X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T * T / (D * D * ((1 - 0.04365 * E2) * 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
 (STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 11.0 CM)

DBHOE CLASS (CM)	5	10	15	16	18	20	22	24	25	30
14	0.5042	0.5266	0.5339	0.5349	0.5364	0.5376	0.5386	0.5394	0.5398	0.5412
16	0.6732	0.6869	0.6914	0.6920	0.6929	0.6936	0.6942	0.6948	0.6950	0.6959
18		0.7761	0.7790	0.7794	0.7800	0.7805	0.7809	0.7814	0.7814	0.7819
20		0.8295	0.8315	0.8318	0.8322	0.8325	0.8328	0.8330	0.8331	0.8335
22		0.8635	0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
24		0.8862	0.8872	0.8874	0.8876	0.8878	0.8879	0.8880	0.8881	0.8883
26			0.9027	0.9028	0.9030	0.9032	0.9033	0.9034	0.9034	0.9036
28			0.9139	0.9140	0.9141	0.9142	0.9143	0.9144	0.9144	0.9145
30			0.9221	0.9222	0.9223	0.9224	0.9225	0.9225	0.9225	0.9226
32			0.9284	0.9284	0.9285	0.9286	0.9287	0.9287	0.9287	0.9288
34			0.9332	0.9333	0.9333	0.9334	0.9334	0.9335	0.9335	0.9336
36			0.9370	0.9371	0.9371	0.9372	0.9372	0.9373	0.9373	0.9373
38			0.9401	0.9401	0.9402	0.9402	0.9403	0.9403	0.9403	0.9404
40			0.9426	0.9426	0.9427	0.9427	0.9428	0.9428	0.9428	0.9428
42			0.9447	0.9447	0.9447	0.9448	0.9448	0.9448	0.9448	0.9449
44			0.9464	0.9464	0.9464	0.9465	0.9465	0.9465	0.9465	0.9466
46			0.9478	0.9478	0.9479	0.9479	0.9479	0.9479	0.9479	0.9480
48			0.9491	0.9491	0.9491	0.9491	0.9492	0.9492	0.9492	0.9492
50			0.9501	0.9501	0.9502	0.9502	0.9502	0.9502	0.9502	0.9502
52			0.9510	0.9510	0.9511	0.9511	0.9511	0.9511	0.9511	0.9511
54			0.9518	0.9518	0.9519	0.9519	0.9519	0.9519	0.9519	0.9519
56			0.9525	0.9525	0.9526	0.9526	0.9526	0.9526	0.9526	0.9526
58					0.9532	0.9532	0.9532	0.9532	0.9532	0.9532
60					0.9537	0.9537	0.9537	0.9537	0.9537	0.9538
62					0.9542	0.9542	0.9542	0.9542	0.9542	0.9542
64					0.9546	0.9546	0.9546	0.9546	0.9546	0.9547
66					0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
68					0.9554	0.9554	0.9554	0.9554	0.9554	0.9554
70					0.9557	0.9557	0.9557	0.9557	0.9557	0.9557
72					0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
74					0.9562	0.9562	0.9562	0.9562	0.9562	0.9562

EQUATION: $VM/V = R1 + R2*X3 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*(1/(D*0*((1 - 0.04365*B2)*2)))*2))*(1 + S/H)$

T = TOP DIAMETER ; D = DBHOE ; R2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 15.0 CM)

DBHCE CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
18					0.4387	0.4402	0.4414	0.4425	0.4429	0.4447
20	0.4265		0.4357	0.4368	0.5998	0.6009	0.6017	0.6024	0.6027	0.6039
22	0.5916		0.5978	0.5985	0.7003	0.7010	0.7016	0.7021	0.7023	0.7032
24	0.6945		0.7650	0.7654	0.7661	0.7666	0.7671	0.7674	0.7676	0.7682
26	0.7619		0.8101	0.8104	0.8109	0.8113	0.8116	0.8119	0.8120	0.8125
28			0.8419	0.8421	0.8425	0.8428	0.8431	0.8433	0.8434	0.8437
30			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
32			0.8821	0.8822	0.8825	0.8827	0.8828	0.8830	0.8830	0.8833
34			0.8951	0.8953	0.8955	0.8956	0.8957	0.8959	0.8959	0.8961
36			0.9053	0.9054	0.9055	0.9057	0.9058	0.9058	0.9059	0.9060
38			0.9132	0.9133	0.9135	0.9136	0.9137	0.9137	0.9138	0.9139
40			0.9196	0.9197	0.9198	0.9199	0.9200	0.9201	0.9201	0.9202
42			0.9248	0.9249	0.9250	0.9251	0.9251	0.9252	0.9252	0.9253
44			0.9291	0.9291	0.9292	0.9293	0.9294	0.9294	0.9294	0.9295
46			0.9326	0.9327	0.9328	0.9328	0.9329	0.9329	0.9329	0.9330
48			0.9356	0.9357	0.9357	0.9358	0.9359	0.9359	0.9359	0.9359
50				0.9382	0.9382	0.9383	0.9383	0.9384	0.9384	0.9384
52				0.9404	0.9404	0.9404	0.9405	0.9405	0.9405	0.9406
54				0.9422	0.9422	0.9423	0.9423	0.9423	0.9423	0.9424
56				0.9438	0.9438	0.9439	0.9439	0.9439	0.9439	0.9440
58					0.9453	0.9453	0.9453	0.9453	0.9453	0.9453
60					0.9465	0.9465	0.9465	0.9465	0.9465	0.9466
62					0.9476	0.9476	0.9476	0.9476	0.9476	0.9476
64					0.9485	0.9485	0.9485	0.9485	0.9485	0.9486
66					0.9494	0.9494	0.9494	0.9494	0.9494	0.9494
68					0.9501	0.9501	0.9501	0.9501	0.9502	0.9502
70					0.9508	0.9508	0.9508	0.9508	0.9508	0.9509
72					0.9514	0.9514	0.9514	0.9514	0.9515	0.9515
74					0.9520	0.9520	0.9520	0.9520	0.9520	0.9520

EQUATION: $VM/V = R1 + R2 * X3 + R3 * X3 * X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T * T / (D * D * ((1 - 0.04365 * B2) * #2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBHOB ; E2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
(STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 19.0 CM)

DBHOB CLASS (CM)	TOTAL HEIGHT (M)									
	5	10	15	16	18	20	22	24	25	30
22			0.3645	0.3658	0.3680	0.3697	0.3712	0.3723	0.3729	0.3749
24	0.3541		0.5225	0.5234	0.5250	0.5263	0.5273	0.5281	0.5285	0.5300
26			0.6289	0.6296	0.6308	0.6317	0.6325	0.6331	0.6334	0.6345
28			0.7031	0.7036	0.7045	0.7052	0.7058	0.7063	0.7065	0.7073
30			0.7563	0.7567	0.7574	0.7579	0.7584	0.7587	0.7589	0.7596
32			0.7954	0.7957	0.7963	0.7967	0.7971	0.7974	0.7975	0.7980
34			0.8248	0.8251	0.8255	0.8259	0.8261	0.8264	0.8265	0.8269
36			0.8473	0.8476	0.8479	0.8482	0.8485	0.8487	0.8487	0.8491
38			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
40			0.8785	0.8790	0.8793	0.8795	0.8796	0.8798	0.8798	0.8801
42			0.8901	0.8902	0.8904	0.8906	0.8907	0.8908	0.8909	0.8911
44			0.8992	0.8993	0.8995	0.8996	0.8997	0.8998	0.8999	0.9000
46			0.9066	0.9067	0.9069	0.9070	0.9071	0.9072	0.9073	0.9074
48			0.9129	0.9129	0.9131	0.9132	0.9133	0.9134	0.9134	0.9135
50				0.9182	0.9183	0.9184	0.9185	0.9185	0.9186	0.9187
52				0.9227	0.9227	0.9228	0.9228	0.9229	0.9229	0.9230
54				0.9263	0.9264	0.9265	0.9265	0.9265	0.9265	0.9267
56				0.9296	0.9296	0.9297	0.9297	0.9298	0.9298	0.9299
58						0.9325	0.9325	0.9326	0.9326	0.9327
60						0.9349	0.9349	0.9350	0.9350	0.9351
62						0.9370	0.9371	0.9371	0.9371	0.9372
64						0.9389	0.9389	0.9389	0.9390	0.9390
66						0.9406	0.9406	0.9406	0.9406	0.9407
68						0.9420	0.9420	0.9420	0.9421	0.9421
70						0.9433	0.9433	0.9434	0.9434	0.9434
72						0.9445	0.9445	0.9445	0.9445	0.9446
74						0.9455	0.9455	0.9456	0.9456	0.9456

EQUATION: $VM/V = R1 + R2 * X3 + R3 * X3 * X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T * (D * D * ((1 - 0.04365 * R2) * 2))) * (1 + S/H)$

T = TCP DIAMETER ; D = DBHOB ; E2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
 (STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 23.0 CM)

DBH CLASS (CM)	5	10	15	16	18	20	22	24	25	30
26			0.3111	0.3125	0.3149	0.3168	0.3184	0.3196	0.3202	0.3225
28			0.4617	0.4628	0.4646	0.4660	0.4672	0.4682	0.4686	0.4703
30			0.5690	0.5698	0.5712	0.5723	0.5732	0.5740	0.5743	0.5756
32			0.6473	0.6480	0.6491	0.6499	0.6507	0.6512	0.6515	0.6526
34			0.7058	0.7063	0.7072	0.7079	0.7084	0.7089	0.7091	0.7100
36			0.7502	0.7507	0.7514	0.7519	0.7524	0.7528	0.7530	0.7537
38			0.7847	0.7850	0.7856	0.7861	0.7865	0.7868	0.7869	0.7875
40			0.8117	0.8120	0.8125	0.8129	0.8132	0.8135	0.8136	0.8141
42			0.8333	0.8336	0.8340	0.8343	0.8346	0.8348	0.8349	0.8353
44			0.8507	0.8509	0.8513	0.8516	0.8518	0.8520	0.8521	0.8524
46			0.8649	0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
48			0.8767	0.8768	0.8771	0.8773	0.8775	0.8776	0.8777	0.8779
50				0.8866	0.8868	0.8870	0.8871	0.8872	0.8873	0.8875
52				0.8948	0.8950	0.8951	0.8952	0.8954	0.8954	0.8956
54				0.9017	0.9019	0.9020	0.9021	0.9022	0.9023	0.9024
56				0.9076	0.9078	0.9079	0.9080	0.9081	0.9081	0.9083
58					0.9173	0.9173	0.9174	0.9175	0.9175	0.9176
60					0.9211	0.9211	0.9212	0.9213	0.9213	0.9214
62					0.9245	0.9245	0.9245	0.9246	0.9246	0.9247
64					0.9274	0.9274	0.9274	0.9275	0.9275	0.9276
66					0.9300	0.9300	0.9300	0.9301	0.9301	0.9302
68					0.9323	0.9323	0.9323	0.9324	0.9324	0.9324
70					0.9343	0.9343	0.9343	0.9344	0.9344	0.9345
72					0.9362	0.9362	0.9362	0.9362	0.9362	0.9363
74										

EQUATION: $VM/V = R1 + R2*X2 + R3*X3*X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X3 = (T*T/(D*D*((1 - 0.04365*B2)**2)))*(1 + S/H)$

T = TCP DIAMETER ; C = DBH08 ; B2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

RATIO OF MERCHANTABLE VOLUME TO TOTAL VOLUME
 (STUMP HEIGHT = 0.30 M ; TOP DIAMETER INSIDE BARK = 27.0 CM)

DBH@E CLASS (CM)	5	10	15	16	18	20	22	24	25	30
30			0.2696	0.2711	0.2737	0.2757	0.2774	0.2787	0.2793	0.2818
32			0.4120	0.4132	0.4152	0.4168	0.4181	0.4191	0.4196	0.4215
34			0.5177	0.5187	0.5203	0.5215	0.5226	0.5234	0.5238	0.5253
36			0.5978	0.5985	0.5998	0.6009	0.6017	0.6024	0.6027	0.6039
38			0.6594	0.6601	0.6611	0.6619	0.6626	0.6632	0.6634	0.6645
40			0.7076	0.7081	0.7090	0.7097	0.7103	0.7108	0.7110	0.7118
42			0.7458	0.7463	0.7470	0.7476	0.7481	0.7485	0.7486	0.7493
44			0.7765	0.7769	0.7775	0.7780	0.7784	0.7789	0.7789	0.7795
46			0.8015	0.8018	0.8023	0.8027	0.8031	0.8034	0.8035	0.8040
48			0.8219	0.8222	0.8226	0.8230	0.8233	0.8235	0.8236	0.8241
50				0.8391	0.8395	0.8398	0.8400	0.8403	0.8404	0.8407
52				0.8532	0.8536	0.8538	0.8541	0.8542	0.8543	0.8547
54				0.8651	0.8654	0.8657	0.8659	0.8660	0.8661	0.8664
56				0.8752	0.8755	0.8757	0.8759	0.8760	0.8761	0.8763
58						0.8843	0.8844	0.8846	0.8846	0.8849
60						0.8917	0.8918	0.8919	0.8920	0.8922
62						0.8981	0.8982	0.8983	0.8983	0.8985
64						0.9036	0.9037	0.9038	0.9039	0.9040
66							0.9086	0.9087	0.9087	0.9089
68							0.9129	0.9129	0.9130	0.9131
70							0.9166	0.9167	0.9167	0.9169
72							0.9200	0.9201	0.9201	0.9202
74							0.9230	0.9230	0.9231	0.9232

EQUATION: $VM/V = R1 + R2 * X2 + R3 * X3 * X3$

WHERE: VM = MERCHANTABLE VOLUME; V = TOTAL VOLUME; R1 = 0.9604 ; R2 = -0.1660 ; R3 = -0.7868

$X2 = (T * T / (D * D * ((1 - 0.04365 * B2) * 2))) * (1 + S/H)$

T = TOP DIAMETER ; D = DBH@E ; E2 = 0.154 ; S = STUMP HEIGHT ; H = TOTAL HEIGHT

APPENDIX IV Stump Diameter Outside Bark Using Diameter
Breast Height Outside Bark

SPECIES	PAGE
Eastern white pine (<u>Pinus strobus</u> L.)	84
Red pine (<u>Pinus resinosa</u> Ait.)	85
Jack pine (<u>Pinus banksiana</u> Lamb.)	86
Lodgepole pine (<u>Pinus contorta</u> Dougl. var. <u>latifolia</u> Engelm.)	87
Black spruce (<u>Picea mariana</u> (Mill.) B.S.P.)	88
Red spruce (<u>Picea rubens</u> Sarg.)	89
White spruce (<u>Picea glauca</u> (Moench) Voss.)	90
Balsam fir (<u>Abies balsamea</u> (L.) (Mill.))	91
Softwoods	92
Poplar spp. (<u>Populus</u>)	93
White birch (<u>Betula papyrifera</u> Marsh.)	94
Yellow birch (<u>Betula alleghaniensis</u> Britt.)	95
Hardwoods	96

STUMP DIAMETER OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DEHCB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
2	2.7	2.6	2.5	2.5	2.4	2.4	2.3	
4	5.4	5.2	5.1	5.0	4.8	4.7	4.6	
6	8.1	7.8	7.6	7.5	7.3	7.1	6.9	
8	10.9	10.4	10.2	10.0	9.7	9.4	9.2	
10	13.6	13.0	12.7	12.5	12.1	11.8	11.5	
12	16.3	15.6	15.3	15.0	14.5	14.1	13.8	
14	19.0	18.2	17.8	17.5	16.9	16.5	16.1	
16	21.7	20.7	20.3	20.0	19.4	18.8	18.4	
18	24.4	23.3	22.9	22.5	21.8	21.2	20.7	
20	27.1	25.9	25.4	25.0	24.2	23.6	23.0	
22	29.9	28.5	28.0	27.5	26.6	25.9	25.3	
24	32.6	31.1	30.5	30.0	29.0	28.3	27.6	
26	35.3	33.7	33.1	32.5	31.5	30.6	29.9	
28	38.0	36.3	35.6	35.0	33.9	33.0	32.2	
30	40.7	38.9	38.1	37.5	36.3	35.3	34.5	
32	43.4	41.5	40.7	40.0	38.7	37.7	36.8	
34	46.1	44.1	43.2	42.5	41.2	40.0	39.1	
36	48.9	46.7	45.8	45.0	43.6	42.4	41.4	
38	51.6	49.3	48.3	47.5	46.0	44.7	43.7	
40	54.3	51.9	50.9	50.0	48.4	47.1	46.0	
42	57.0	54.5	53.4	52.5	50.8	49.5	48.3	
44	59.7	57.0	55.9	55.0	53.3	51.8	50.6	
46	62.4	59.6	58.5	57.5	55.7	54.2	52.9	
48	65.1	62.2	61.0	60.0	58.1	56.5	55.2	
50	67.9	64.8	63.6	62.5	60.5	58.9	57.5	
52	70.6	67.4	66.1	65.0	62.9	61.2	59.8	
54	73.3	70.0	68.7	67.5	65.4	63.6	62.1	
56	76.0	72.6	71.2	70.0	67.8	65.9	64.4	
58	78.7	75.2	73.7	72.4	70.2	68.3	66.7	
60	81.4	77.8	76.3	74.9	72.6	70.7	69.0	
62	84.1	80.4	78.8	77.4	75.0	73.0	71.3	
64	86.9	83.0	81.4	79.9	77.5	75.4	73.5	
66	89.6	85.6	83.9	82.4	79.9	77.7	75.8	
68	92.3	88.2	86.5	84.9	82.3	80.1	78.1	
70	95.0	90.8	89.0	87.4	84.7	82.4	80.4	
72	97.7	93.3	91.5	89.9	87.1	84.8	82.7	
74	100.4	95.9	94.1	92.4	89.6	87.1	85.0	

EQUATION: DS = D(1-0.04365*B2)(1+B1*LOG(1.6764/(S+0.3048)))
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DRHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.216 ; B2 = 0.184

DATA SOURCE: 599 TREES FROM N.B., GUE., CNT.

STUMP DIAMETER OUTSIDE BARK (CM)

RED PINE

/ PINUS RESINOSA AIT.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.8	7.5	7.3	7.2	7.0	6.9	6.7
8	10.4	10.0	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.1	11.7	11.5	11.2
12	15.5	14.9	14.7	14.5	14.1	13.8	13.5
14	18.1	17.4	17.1	16.9	16.4	16.1	15.7
16	20.7	19.9	19.6	19.3	18.8	18.3	18.0
18	23.3	22.4	22.0	21.7	21.1	20.6	20.2
20	25.9	24.9	24.5	24.1	23.5	22.9	22.5
22	28.5	27.4	26.9	26.5	25.8	25.2	24.7
24	31.1	29.9	29.4	28.9	28.2	27.5	27.0
26	33.7	32.4	31.8	31.3	30.5	29.8	29.2
28	36.3	34.9	34.3	33.8	32.9	32.1	31.4
30	38.8	37.3	36.7	36.2	35.2	34.4	33.7
32	41.4	39.8	39.2	38.6	37.6	36.7	35.9
34	44.0	42.3	41.6	41.0	39.9	39.0	38.2
36	46.6	44.8	44.1	43.4	42.3	41.3	40.4
38	49.2	47.3	46.5	45.8	44.6	43.6	42.7
40	51.8	49.8	49.0	48.2	46.9	45.9	44.9
42	54.4	52.3	51.4	50.6	49.3	48.2	47.2
44	57.0	54.8	53.9	53.0	51.6	50.5	49.4
46	59.6	57.3	56.3	55.5	54.0	52.7	51.7
48	62.2	59.7	58.8	57.9	56.3	55.0	53.9
50	64.7	62.2	61.2	60.3	58.7	57.3	56.2
52	67.3	64.7	63.7	62.7	61.0	59.6	58.4
54	69.9	67.2	66.1	65.1	63.4	61.9	60.7
56	72.5	69.7	68.5	67.5	65.7	64.2	62.9
58	75.1	72.2	71.0	69.9	68.1	66.5	65.1
60	77.7	74.7	73.4	72.3	70.4	68.8	67.4
62	80.3	77.2	75.9	74.7	72.8	71.1	69.6
64	82.9	79.7	78.3	77.2	75.1	73.4	71.9
66	85.5	82.1	80.8	79.6	77.5	75.7	74.1
68	88.1	84.6	83.2	82.0	79.8	78.0	76.4
70	90.6	87.1	85.7	84.4	82.2	80.3	78.6
72	93.2	89.6	88.1	86.8	84.5	82.6	80.9
74	95.8	92.1	90.6	89.2	86.9	84.9	83.1

EQUATION: $DS = C(1 - 0.04365 * B2)(1 + B1 * \text{LOG}(1.6764 / (S + 0.3048)))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.178 ; B2 = 0.151

DATA SOURCE: 740 TREES FROM N.E., QUE., ONT.

STUMP DIAMETER OUTSIDE BARK (CM)

JACK PINE

/ PINUS BANKSIANA LAMBE.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.3
4	5.2	5.0	4.9	4.8	4.7	4.6	4.5
6	7.3	7.5	7.3	7.2	7.0	6.9	6.7
8	10.9	9.9	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.0	11.7	11.4	11.2
12	15.5	14.9	14.7	14.4	14.1	13.7	13.5
14	18.1	17.4	17.1	16.8	16.4	16.0	15.7
16	20.7	19.9	19.5	19.3	18.7	18.3	17.9
18	23.2	22.4	22.0	21.7	21.1	20.6	20.2
20	25.8	24.8	24.4	24.1	23.4	22.9	22.4
22	28.4	27.3	26.9	26.5	25.8	25.2	24.7
24	31.0	29.8	29.3	28.9	28.1	27.5	26.9
26	33.6	32.3	31.8	31.3	30.5	29.8	29.2
28	36.2	34.8	34.2	33.7	32.8	32.1	31.4
30	38.7	37.3	36.6	36.1	35.1	34.3	33.7
32	41.3	39.7	39.1	38.5	37.5	36.6	35.9
34	43.9	42.2	41.5	40.9	39.8	38.9	38.1
36	46.5	44.7	44.0	43.3	42.2	41.2	40.4
38	49.1	47.2	46.4	45.7	44.5	43.5	42.6
40	51.7	49.7	48.9	48.1	46.9	45.8	44.9
42	54.2	52.2	51.3	50.5	49.2	48.1	47.1
44	56.8	54.6	53.7	52.9	51.6	50.4	49.4
46	59.4	57.1	56.2	55.3	53.9	52.7	51.6
48	62.0	59.6	58.6	57.8	56.2	55.0	53.8
50	64.6	62.1	61.1	60.2	58.6	57.2	56.1
52	67.2	64.6	63.5	62.6	60.9	59.5	58.3
54	69.7	67.1	66.0	65.0	63.3	61.8	60.6
56	72.3	69.5	68.4	67.4	65.6	64.1	62.8
58	74.9	72.0	70.8	69.8	68.0	66.4	65.1
60	77.5	74.5	73.3	72.2	70.3	68.7	67.3
62	80.1	77.0	75.7	74.6	72.6	71.0	69.5
64	82.7	79.5	78.2	77.0	75.0	73.3	71.8
66	85.2	82.0	80.6	79.4	77.3	75.6	74.0
68	87.8	84.4	83.1	81.8	79.7	77.9	76.3
70	90.4	86.9	85.5	84.2	82.0	80.1	78.5
72	93.0	89.4	87.9	86.6	84.4	82.4	80.8
74	95.6	91.9	90.4	89.0	86.7	84.7	83.0

EQUATION: DS = D(1-0.04365*B2)(1+B1*LCG(1.6764/(S+0.3048)))

WHERE: CS = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B1 = 0.176 ; B2 = 0.151

DATA SOURCE: 1472 TREES FROM GUE., CNT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.4	2.4	2.3	2.3	2.3	2.2	2.2
4	4.9	4.7	4.7	4.6	4.5	4.4	4.4
6	7.3	7.1	7.0	6.9	6.8	6.6	6.5
8	9.7	9.4	9.3	9.2	9.0	8.9	8.7
10	12.2	11.8	11.6	11.5	11.3	11.1	10.9
12	14.6	14.1	14.0	13.8	13.5	13.3	13.1
14	17.0	16.5	16.3	16.1	15.8	15.5	15.3
16	19.4	18.9	18.6	18.4	18.0	17.7	17.4
18	21.9	21.2	20.9	20.7	20.3	19.9	19.6
20	24.3	23.6	23.3	23.0	22.5	22.1	21.8
22	26.7	25.9	25.6	25.3	24.8	24.4	24.0
24	29.2	28.3	27.9	27.6	27.0	26.6	26.2
26	31.6	30.6	30.3	29.9	29.3	28.8	28.3
28	34.0	33.0	32.6	32.2	31.5	31.0	30.5
30	36.5	35.4	34.9	34.5	33.8	33.2	32.7
32	38.9	37.7	37.2	36.8	36.1	35.4	34.9
34	41.3	40.1	39.6	39.1	38.3	37.6	37.1
36	43.8	42.4	41.9	41.4	40.6	39.8	39.2
38	46.2	44.8	44.2	43.7	42.8	42.1	41.4
40	48.6	47.1	46.5	46.0	45.1	44.3	43.6
42	51.0	49.5	48.9	48.3	47.3	46.5	45.8
44	53.5	51.9	51.2	50.6	49.6	48.7	47.9
46	55.9	54.2	53.5	52.9	51.8	50.9	50.1
48	58.3	56.6	55.9	55.2	54.1	53.3	52.3
50	60.8	58.9	58.2	57.5	56.3	55.3	54.5
52	63.2	61.3	60.5	59.8	58.6	57.6	56.7
54	65.6	63.6	62.8	62.1	60.8	59.8	58.8
56	68.1	66.0	65.2	64.4	63.1	62.0	61.0
58	70.5	68.4	67.5	66.7	65.3	64.2	63.2
60	72.9	70.7	69.8	69.0	67.6	66.4	65.4
62	75.4	73.1	72.1	71.3	69.9	68.6	67.6
64	77.8	75.4	74.5	73.6	72.1	70.8	69.7
66	80.2	77.8	76.8	75.9	74.4	73.1	71.9
68	82.6	80.1	79.1	78.2	76.6	75.3	74.1
70	85.1	82.5	81.4	80.5	78.9	77.5	76.3
72	87.5	84.9	83.8	82.8	81.1	79.7	78.5
74	89.9	87.2	86.1	85.1	83.4	81.9	80.6

EQUATION: $DS = D(1 - 0.04365 * B2) * (1 + B1 * LCG(1.6764 / (S + 0.3048)))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.130 ; B2 = 0.118

DATA SOURCE: 748 TREES FROM ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DBHCB CLASS (CM)	STUMP HEIGHT (M)							0.50
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
2	2.6	2.5	2.5	2.4	2.4	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.8	4.6	4.5
6	7.9	7.6	7.5	7.3	7.1	7.1	7.0	6.8
8	10.6	10.1	10.0	9.8	9.5	9.5	9.3	9.1
10	13.2	12.7	12.4	12.2	11.9	11.6	11.6	11.3
12	15.9	15.2	14.9	14.7	14.5	14.3	13.9	13.6
14	18.5	17.7	17.4	17.1	16.6	16.2	15.9	15.9
16	21.1	20.3	19.9	19.0	18.6	18.1	18.0	18.1
18	23.8	22.8	22.4	22.0	21.4	20.9	20.4	20.4
20	26.4	25.3	24.9	24.5	23.8	23.2	22.7	22.7
22	29.1	27.9	27.4	26.9	26.2	25.5	25.0	25.0
24	31.7	30.4	29.9	29.4	28.5	27.8	27.2	27.5
26	34.4	32.9	32.3	31.8	30.9	30.2	29.5	29.5
28	37.0	35.5	34.8	34.3	33.3	32.5	31.8	31.8
30	39.6	38.0	37.3	36.7	35.7	34.8	34.0	34.0
32	42.3	40.5	39.8	39.2	38.1	37.1	36.3	36.3
34	44.9	43.1	42.3	41.6	40.4	39.4	38.6	38.6
36	47.6	45.6	44.8	44.1	42.8	41.8	40.8	40.8
38	50.2	48.1	47.3	46.5	45.2	44.1	43.1	43.1
40	52.8	50.7	49.8	49.0	47.6	46.4	45.4	45.4
42	55.5	53.2	52.3	51.4	49.9	48.7	47.6	47.6
44	58.1	55.7	54.7	53.9	52.3	51.0	49.9	49.9
46	60.8	58.3	57.2	56.3	54.7	53.3	52.2	52.2
48	63.4	60.8	59.7	58.8	57.1	55.7	54.4	54.4
50	66.1	63.3	62.2	61.2	59.5	58.0	56.7	56.7
52	68.7	65.9	64.7	63.6	61.8	60.3	59.0	59.0
54	71.3	68.4	67.2	66.1	64.2	62.6	61.2	61.2
56	74.0	70.9	69.7	68.5	66.6	64.9	63.5	63.5
58	76.6	73.5	72.2	71.0	69.0	67.3	65.8	65.8
60	79.3	76.0	74.6	73.4	71.4	69.6	68.1	68.1
62	81.9	78.5	77.1	75.9	73.7	71.9	70.3	70.3
64	84.6	81.1	79.6	78.3	76.1	74.2	72.6	72.6
66	87.2	83.6	82.1	80.8	78.5	76.5	74.9	74.9
68	89.8	86.1	84.6	83.2	80.9	78.9	77.1	77.1
70	92.5	88.7	87.1	85.7	83.2	81.2	79.4	79.4
72	95.1	91.2	89.6	88.1	85.6	83.5	81.7	81.7
74	97.8	93.7	92.1	90.6	88.0	85.8	83.9	83.9

EQUATION: $DS = D(1 - 0.04365 * B2)(1 + B1 * LCG(1.6764 / (S + 0.3048)))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; 0 = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.194 ; B2 = 0.164

DATA SOURCE: 723 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.6	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.7	4.6
6	8.0	7.7	7.5	7.4	7.2	7.0	6.8
8	10.7	10.2	10.0	9.9	9.6	9.5	9.1
10	13.3	12.8	12.5	12.3	12.0	11.7	11.4
12	16.0	15.3	15.0	14.8	14.4	14.0	13.7
14	18.7	17.9	17.5	17.2	16.7	16.3	15.9
16	21.3	20.4	20.0	19.7	19.1	18.6	18.2
18	24.0	23.0	22.6	22.2	21.5	21.0	20.5
20	26.7	25.5	25.1	24.6	23.9	23.3	22.8
22	29.3	28.1	27.6	27.1	26.3	25.6	25.1
24	32.0	30.6	30.1	29.6	28.7	28.0	27.3
26	34.7	33.2	32.6	32.0	31.1	30.3	29.6
28	37.3	35.7	35.1	34.5	33.5	32.6	31.9
30	40.0	38.3	37.6	37.0	35.9	35.0	34.2
32	42.6	40.8	40.1	39.4	38.3	37.3	36.4
34	45.3	43.4	42.6	41.9	40.7	39.6	38.7
36	48.0	45.9	45.1	44.4	43.1	42.0	41.0
38	50.6	48.5	47.6	46.8	45.4	44.3	43.3
40	53.3	51.0	50.1	49.3	47.8	46.6	45.6
42	56.0	53.6	52.6	51.7	50.2	49.0	47.8
44	58.6	56.2	55.1	54.2	52.6	51.3	50.1
46	61.3	58.7	57.6	56.7	55.0	53.6	52.4
48	64.0	61.3	60.1	59.1	57.4	55.9	54.7
50	66.6	63.8	62.6	61.6	59.8	58.3	57.0
52	69.3	66.4	65.2	64.1	62.2	60.6	59.2
54	72.0	68.9	67.7	66.5	64.6	62.9	61.5
56	74.6	71.5	70.2	69.0	67.0	65.3	63.8
58	77.3	74.0	72.7	71.5	69.4	67.6	66.1
60	80.0	76.6	75.2	73.9	71.8	69.9	68.3
62	82.6	79.1	77.7	76.4	74.2	72.3	70.6
64	85.3	81.7	80.2	78.9	76.5	74.6	72.9
66	88.0	84.2	82.7	81.3	78.9	76.9	75.2
68	90.6	86.8	85.2	83.8	81.3	79.3	77.5
70	93.3	89.3	87.7	86.2	83.7	81.6	79.7
72	96.0	91.9	90.2	88.7	86.1	83.9	82.0
74	98.6	94.4	92.7	91.2	88.5	86.2	84.3

EQUATION: $DS = D(1 - 0.04365 * E2)(1 + E1 * LCG(1.6764 / (S + 0.3048)))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 E1 = 0.201 ; E2 = 0.169

DATA SOURCE: 73 TREES FROM N.B.

STUMP DIAMETER OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MCENCH) VCSS

DBHOB CLASS (CM)	STUMP HEIGHT (M)					0.50
	0.00	0.10	0.15	0.20	0.30	
2	2.7	2.5	2.5	2.5	2.4	2.3
4	5.4	5.1	5.0	5.0	4.8	4.6
6	8.0	7.7	7.6	7.4	7.2	6.9
8	10.7	10.3	10.1	9.9	9.6	9.1
10	13.4	12.8	12.6	12.4	12.0	11.4
12	16.1	15.4	15.1	14.9	14.4	13.7
14	18.8	18.0	17.6	17.3	16.8	16.0
16	21.5	20.5	20.1	19.8	19.2	18.3
18	24.1	23.1	22.7	22.3	21.6	20.6
20	26.8	25.7	25.2	24.8	24.0	22.8
22	29.5	28.2	27.7	27.2	26.4	25.1
24	32.2	30.8	30.2	29.7	28.8	27.4
26	34.9	33.4	32.7	32.2	31.2	29.7
28	37.5	35.9	35.3	34.7	33.6	32.0
30	40.2	38.5	37.8	37.1	36.0	34.3
32	42.9	41.0	40.3	39.6	38.4	36.6
34	45.6	43.6	42.8	42.1	40.8	38.8
36	48.3	46.2	45.3	44.6	43.2	41.1
38	51.0	48.7	47.8	47.0	45.5	43.4
40	53.6	51.3	50.4	49.5	48.0	45.7
42	56.3	53.9	52.9	52.0	50.4	48.0
44	59.0	56.4	55.4	54.5	52.8	50.3
46	61.7	59.0	57.9	56.9	55.2	52.5
48	64.4	61.6	60.4	59.4	57.6	54.8
50	67.0	64.1	62.9	61.9	60.0	57.1
52	69.7	66.7	65.5	64.4	62.4	59.4
54	72.4	69.3	68.0	66.8	64.8	61.7
56	75.1	71.8	70.5	69.3	67.2	64.0
58	77.8	74.4	73.0	71.8	69.6	66.3
60	80.4	77.0	75.5	74.3	72.0	68.5
62	83.1	79.5	78.1	76.7	74.4	70.8
64	85.8	82.1	80.6	79.2	76.8	73.1
66	88.5	84.7	83.1	81.7	79.2	75.4
68	91.2	87.2	85.6	84.2	81.6	77.7
70	93.9	89.8	88.1	86.6	84.1	80.0
72	96.5	92.4	90.6	89.1	86.5	82.2
74	99.2	94.9	93.2	91.6	88.9	84.5

EQUATION: DS = D(1-0.04365*B2)(1+B1*LCG(1.6764/(S+0.3048)))

WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; 0 = DBHCB ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B1 = 0.206 ; B2 = 0.176

DATA SOURCE: 646 TREES FROM N.E., GUE., CNT., MAN., SASK., ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.25
4	5.2	5.0	4.9	4.8	4.7	4.7	4.6
6	7.3	7.5	7.3	7.2	7.0	6.9	6.7
8	10.9	9.9	9.8	9.6	9.4	9.2	9.0
10	12.9	12.4	12.2	12.0	11.7	11.4	11.25
12	15.5	14.9	14.7	14.4	14.1	13.7	13.5
14	18.1	17.4	17.1	16.8	16.4	16.0	15.7
16	20.7	19.9	19.5	19.3	18.7	18.3	17.9
18	23.2	22.4	22.0	21.7	21.1	20.6	20.2
20	25.8	24.8	24.4	24.1	23.4	22.9	22.4
22	28.4	27.3	26.9	26.5	25.8	25.2	24.7
24	31.0	29.8	29.3	28.9	28.1	27.5	26.9
26	33.6	32.3	31.8	31.3	30.5	29.9	29.2
28	36.2	34.8	34.2	33.7	32.8	32.1	31.4
30	38.7	37.3	36.6	36.1	35.1	34.3	33.6
32	41.3	39.7	39.1	38.5	37.5	36.6	35.9
34	43.9	42.2	41.5	40.9	39.8	38.9	38.1
36	46.5	44.7	44.0	43.3	42.2	41.2	40.4
38	49.1	47.2	46.4	45.7	44.5	43.5	42.6
40	51.7	49.7	48.9	48.1	46.9	45.8	44.9
42	54.2	52.2	51.3	50.5	49.2	48.1	47.1
44	56.8	54.6	53.7	52.9	51.6	50.4	49.4
46	59.4	57.1	56.2	55.3	53.9	52.7	51.6
48	62.0	59.6	58.6	57.8	56.2	55.0	53.8
50	64.6	62.1	61.1	60.2	58.6	57.2	56.1
52	67.2	64.6	63.5	62.6	60.9	59.5	58.3
54	69.7	67.1	66.0	65.0	63.3	61.8	60.6
56	72.3	69.5	68.4	67.4	65.6	64.1	62.8
58	74.9	72.0	70.8	69.8	68.0	66.4	65.1
60	77.5	74.5	73.3	72.2	70.3	68.7	67.3
62	80.1	77.0	75.7	74.6	72.6	71.0	69.5
64	82.7	79.5	78.2	77.0	75.0	73.3	71.8
66	85.2	82.0	80.6	79.4	77.3	75.6	74.0
68	87.8	84.4	83.1	81.8	79.7	77.9	76.3
70	90.4	86.9	85.5	84.2	82.0	80.1	78.5
72	93.0	89.4	87.9	86.6	84.4	82.4	80.8
74	95.6	91.9	90.4	89.0	86.7	84.7	83.0

EQUATION: $DS = D(1 - 0.04366 * B2)(1 + B1 * LCG(1.6764 / (S + 0.3048)))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK; D = DBHCB;
 S = STUMP HEIGHT; LCG = NATURAL LOGARITHM;
 B1 = 0.176; B2 = 0.152

DATA SOURCE: 355 TREES FROM NFLD., N.B., QUE., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)

SOFTWOODS

DEHCB CLASS (CM)	STUMP HEIGHT (M)				
	0.00	0.10	0.15	0.20	0.30
2	2.6	2.5	2.5	2.4	2.4
4	5.2	5.0	4.9	4.8	4.7
6	7.8	7.5	7.4	7.3	7.1
8	10.4	10.0	9.8	9.7	9.4
10	13.0	12.5	12.3	12.1	11.8
12	15.6	15.0	14.7	14.5	14.1
14	18.2	17.5	17.2	16.9	16.5
16	20.8	20.0	19.6	19.3	18.8
18	23.4	22.5	22.1	21.8	21.2
20	26.0	25.0	24.6	24.2	23.5
22	28.6	27.5	27.0	26.6	25.9
24	31.2	30.0	29.5	29.0	28.2
26	33.8	32.5	31.9	31.4	30.6
28	36.4	35.0	34.4	33.9	32.9
30	39.0	37.5	36.9	36.3	35.3
32	41.6	40.0	39.3	38.7	37.6
34	44.2	42.5	41.7	41.1	40.0
36	46.8	45.0	44.2	43.5	42.4
38	49.4	47.5	46.7	45.9	44.7
40	52.0	49.9	49.1	48.4	47.1
42	54.6	52.4	51.6	50.8	49.4
44	57.2	54.9	54.0	53.2	51.8
46	59.8	57.4	56.5	55.6	54.1
48	62.4	59.9	58.9	58.0	56.5
50	65.0	62.4	61.4	60.5	59.0
52	67.6	64.9	63.8	62.9	61.2
54	70.2	67.4	66.3	65.3	63.5
56	72.8	69.9	68.8	67.7	65.9
58	75.4	72.4	71.2	70.1	68.2
60	78.0	74.9	73.7	72.5	70.6
62	80.6	77.4	76.1	75.0	73.3
64	83.2	79.9	78.6	77.4	75.8
66	85.8	82.4	81.0	79.8	78.1
68	88.4	84.9	83.5	82.2	80.4
70	91.0	87.4	85.9	84.6	82.7
72	93.6	89.9	88.4	87.0	84.7
74	96.2	92.4	90.9	89.5	87.1

EQUATION: DS = (1-0.04265*B2)(1+E1*LCG(1.6764/(S+0.3048)))
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; C = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 E1 = 0.181 ; B2 = 0.155

DATA SOURCE: 5356 TREES FROM CENTRAL AND EASTERN CANADA

STUMP DIAMETER OUTSIDE BARK (CM)

POPLAR / PCPULUS SPP.

DBHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.5	2.4	2.4	2.3	2.5	2.2	2.2
4	4.9	4.8	4.7	4.6	4.5	4.5	4.4
6	7.4	7.2	7.1	7.0	6.8	6.7	6.6
8	9.9	9.5	9.4	9.3	9.1	8.9	8.8
10	12.8	11.9	11.8	11.6	11.4	11.2	11.0
12	14.8	14.3	14.1	13.9	13.6	13.4	13.2
14	17.2	16.7	16.5	16.3	15.9	15.6	15.4
16	19.7	19.1	18.8	18.6	18.2	17.8	17.5
18	22.2	21.5	21.2	20.9	20.5	20.1	19.7
20	24.6	23.8	23.5	23.2	22.7	22.3	21.9
22	27.1	26.2	25.9	25.6	25.0	24.5	24.1
24	29.6	28.6	28.2	27.9	27.3	26.8	26.3
26	32.0	31.0	30.6	30.2	29.5	29.0	28.5
28	34.5	33.4	32.9	32.5	31.8	31.2	30.7
30	37.0	35.8	35.3	34.8	34.1	33.5	32.9
32	39.4	38.2	37.6	37.2	36.4	35.7	35.1
34	41.9	40.5	40.0	39.5	38.6	37.9	37.3
36	44.3	42.9	42.3	41.8	40.9	40.1	39.5
38	46.8	45.3	44.7	44.1	43.2	42.4	41.7
40	49.3	47.7	47.0	46.5	45.5	44.6	43.9
42	51.7	50.1	49.4	48.8	47.7	46.8	46.1
44	54.2	52.5	51.7	51.1	50.0	49.1	48.3
46	56.7	54.8	54.1	53.4	52.3	51.3	50.4
48	59.1	57.2	56.5	55.8	54.5	53.8	52.6
50	61.6	59.6	58.8	58.1	56.8	55.8	54.8
52	64.1	62.0	61.2	60.4	59.1	58.0	57.0
54	66.5	64.4	63.5	62.7	61.4	60.2	59.2
56	69.0	66.8	65.9	65.0	63.6	62.4	61.4
58	71.4	69.2	68.2	67.4	65.9	64.7	63.6
60	73.9	71.5	70.6	69.7	68.2	66.9	65.8
62	76.4	73.9	72.9	72.0	70.5	69.1	68.0
64	78.8	76.3	75.3	74.3	72.7	71.4	70.2
66	81.3	78.7	77.6	76.7	75.0	73.6	72.4
68	83.8	81.1	80.0	79.0	77.3	75.8	74.6
70	86.2	83.5	82.3	81.3	79.5	78.1	76.8
72	88.7	85.8	84.7	83.6	81.8	80.3	79.0
74	91.2	88.2	87.0	86.0	84.1	82.5	81.1

EQUATION: DS = D(1-0.04365*B2)(1+R1*LCG(1.6764/(S+0.3048)))
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.140 ; B2 = 0.127

DATA SOURCE: 541 TREES FROM GUE., CNT., MAN., SASK.

STUMP DIAMETER OUTSIDE BARK (CM)
 WHITE BIRCH / BETULA PAPIRIFERA MARSH.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.6	4.5
6	7.0	7.6	7.5	7.4	7.1	7.0	6.8
8	10.6	10.1	10.0	9.8	9.5	9.3	9.1
10	13.2	12.7	12.5	12.3	11.9	11.6	11.4
12	15.9	15.2	15.0	14.7	14.3	13.9	13.6
14	18.5	17.8	17.4	17.2	16.7	16.3	15.9
16	21.2	20.3	19.9	19.6	19.0	18.6	18.2
18	23.8	22.8	22.4	22.1	21.4	20.9	20.4
20	26.5	25.4	24.9	24.5	23.8	23.2	22.7
22	29.1	27.9	27.4	27.0	26.2	25.5	25.0
24	31.8	30.4	29.9	29.4	28.6	27.9	27.2
26	34.4	33.0	32.4	31.9	31.3	30.2	29.5
28	37.1	35.5	34.9	34.3	33.7	32.5	31.8
30	39.7	38.1	37.4	36.8	35.7	34.8	34.1
32	42.4	40.6	39.9	39.2	38.1	37.1	36.6
34	45.0	43.1	42.4	41.7	40.5	39.5	38.9
36	47.7	45.7	44.9	44.1	42.9	41.8	40.9
38	50.3	48.2	47.3	46.6	45.2	44.1	43.1
40	53.0	50.7	49.8	49.0	47.6	46.4	45.4
42	55.6	53.3	52.3	51.5	50.0	48.8	47.7
44	58.3	55.8	54.8	53.9	52.4	51.1	49.9
46	60.9	58.4	57.3	56.4	54.8	53.4	52.2
48	63.5	60.9	59.8	58.8	57.1	55.7	54.5
50	66.2	63.4	62.3	61.3	59.5	58.0	56.8
52	68.8	66.0	64.8	63.7	61.9	60.4	59.0
54	71.5	68.5	67.3	66.2	64.3	62.7	61.3
56	74.1	71.0	69.8	68.6	66.7	65.0	63.6
58	76.8	73.6	72.3	71.1	69.1	67.3	65.8
60	79.4	76.1	74.8	73.5	71.4	69.7	68.1
62	82.1	78.7	77.7	76.0	73.8	72.0	70.4
64	84.7	81.2	79.7	78.4	76.2	74.3	72.6
66	87.4	83.7	82.2	80.9	78.6	76.6	74.9
68	90.0	86.3	84.7	83.4	81.0	78.9	77.2
70	92.7	88.8	87.2	85.8	83.3	81.3	79.5
72	95.3	91.3	89.7	88.3	85.7	83.6	81.7
74	98.0	93.9	92.2	90.7	88.1	85.9	84.0

EQUATION: $DS = D(1 - 0.04365 \cdot B2)(1 + B1 \cdot LCG(1.6764 / (S + 0.3C(48))))$
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.196 ; B2 = 0.176

DATA SOURCE: 149 TREES FROM GUF., CNT., ALTA.

STUMP DIAMETER OUTSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DBHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.7	2.5	2.5	2.5	2.4	2.3	2.3
4	5.3	5.1	5.0	4.9	4.8	4.6	4.5
6	8.0	7.6	7.5	7.4	7.2	7.0	6.8
8	10.6	10.2	10.0	9.8	9.5	9.3	9.1
10	13.3	12.7	12.5	12.3	11.9	11.6	11.4
12	15.9	15.3	15.0	14.7	14.3	13.9	13.6
14	18.6	17.8	17.5	17.2	16.7	16.3	15.9
16	21.2	20.3	20.0	19.6	19.1	18.6	18.2
18	23.9	22.9	22.5	22.1	21.5	20.9	20.5
20	26.5	25.4	25.0	24.6	23.8	23.2	22.7
22	29.2	28.0	27.5	27.0	26.2	25.6	25.0
24	31.8	30.5	30.0	29.5	28.6	27.9	27.3
26	34.5	33.1	32.5	31.9	31.0	30.2	29.5
28	37.2	35.6	35.0	34.4	33.4	32.5	31.8
30	39.8	38.1	37.5	36.8	35.8	34.9	34.1
32	42.5	40.7	39.9	39.3	38.2	37.2	36.4
34	45.1	43.2	42.4	41.7	40.5	39.5	38.6
36	47.8	45.8	44.9	44.2	42.9	41.8	40.9
38	50.4	48.3	47.4	46.7	45.3	44.2	43.2
40	53.1	50.8	49.9	49.1	47.7	46.5	45.4
42	55.7	53.4	52.4	51.6	50.1	48.8	47.7
44	58.4	55.9	54.9	54.0	52.5	51.1	50.0
46	61.0	58.5	57.4	56.5	54.8	53.5	52.3
48	63.7	61.0	59.9	58.9	57.2	55.8	54.5
50	66.3	63.6	62.4	61.4	59.6	58.1	56.8
52	69.0	66.1	64.9	63.8	62.0	60.4	59.1
54	71.7	68.6	67.4	66.3	64.4	62.8	61.4
56	74.3	71.2	69.9	68.8	66.8	65.1	63.6
58	77.0	73.7	72.4	71.2	69.2	67.4	65.9
60	79.6	76.3	74.9	73.7	71.5	69.7	68.2
62	82.3	78.8	77.4	76.1	73.9	72.1	70.4
64	84.9	81.4	79.9	78.6	76.3	74.4	72.7
66	87.6	83.9	82.4	81.0	78.7	76.7	75.0
68	90.2	86.4	84.9	83.5	81.1	79.0	77.3
70	92.9	89.0	87.4	86.0	83.5	81.4	79.5
72	95.5	91.5	89.9	88.4	85.9	83.7	81.8
74	98.2	94.1	92.4	90.9	88.2	86.0	84.1

EQUATION: DS = D(1-0.04365*B2)(1+E1*LCG(1.6764/(S+0.3048)))
 WHERE: S = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;
 E1 = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 E1 = 0.198 ; B2 = 0.181

DATA SOURCE: 151 TREES FROM GUE., CNT.

STUMP DIAMETER OUTSIDE BARK (CM)

HARDWOODS

DBHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.5	2.4	2.4	2.4	2.3	2.3	2.2
4	5.1	4.9	4.8	4.7	4.6	4.5	4.4
6	7.6	7.3	7.2	7.1	6.9	6.8	6.7
8	10.1	9.8	9.6	9.5	9.2	9.1	8.9
10	12.6	12.2	12.0	11.8	11.6	11.3	11.1
12	15.2	14.6	14.4	14.2	13.9	13.6	13.3
14	17.7	17.1	16.8	16.6	16.2	15.8	15.5
16	20.2	19.5	19.2	19.0	18.5	18.1	17.8
18	22.8	22.0	21.6	21.3	20.8	20.4	20.0
20	25.3	24.4	24.0	23.7	23.1	22.6	22.2
22	27.8	26.8	26.4	26.1	25.4	24.9	24.4
24	30.4	29.3	28.8	28.4	27.7	27.2	26.6
26	32.9	31.7	31.2	30.8	30.0	29.4	28.9
28	35.4	34.1	33.5	33.2	32.4	31.7	31.1
30	37.9	36.6	36.0	35.5	34.7	33.9	33.3
32	40.5	39.0	38.4	37.9	37.0	36.5	35.5
34	43.0	41.5	40.8	40.3	39.3	38.5	37.8
36	45.5	43.9	43.2	42.6	41.6	40.7	40.0
38	48.1	46.3	45.6	45.0	43.9	43.3	42.2
40	50.6	48.8	48.0	47.4	46.2	45.5	44.4
42	53.1	51.2	50.4	49.7	48.5	47.5	46.6
44	55.6	53.7	52.8	52.1	50.9	49.8	48.9
46	58.2	56.1	55.2	54.5	53.2	52.0	51.1
48	60.7	58.5	57.7	56.9	55.5	54.3	53.3
50	63.2	61.0	60.1	59.2	57.8	56.6	55.5
52	65.8	63.4	62.5	61.6	60.1	58.8	57.7
54	68.3	65.9	64.9	64.0	62.4	61.1	60.0
56	70.8	68.3	67.3	66.3	64.7	63.4	62.2
58	73.4	70.7	69.7	68.7	67.0	65.6	64.4
60	75.9	73.2	72.1	71.1	69.3	67.9	66.6
62	78.4	75.6	74.5	73.4	71.7	70.1	68.8
64	80.9	78.1	76.9	75.8	74.0	72.4	71.1
66	83.5	80.5	79.3	78.2	76.3	74.7	73.3
68	86.0	82.9	81.7	80.5	78.6	76.9	75.5
70	88.5	85.4	84.1	82.9	80.9	79.2	77.7
72	91.1	87.8	86.5	85.3	83.2	81.5	79.9
74	93.6	90.2	88.9	87.7	85.5	83.7	82.2

EQUATION: DS = D(1-0.04365*B2)(1+E1*LCG(1.6764/(S+0.3048)))
 WHERE: DS = STUMP DIAMETER OUTSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B1 = 0.160 ; B2 = 0.145

DATA SOURCE: 341 TREES FROM GUE., GNT., MAN., SASK., ALTA.

**APPENDIX V Diameter Breast Height Outside Bark Using
Stump Diameter Outside Bark**

SPECIES	PAGE
Eastern white pine (<u>Pinus strobus</u> L.)	98
Red pine (<u>Pinus resinosa</u> Ait.)	99
Jack pine (<u>Pinus banksiana</u> Lamb.)	100
Lodgepole pine (<u>Pinus contorta</u> Dougl. var. <u>latifolia</u> Engelm.)	101
Black spruce (<u>Picea mariana</u> (Mill.) B.S.P.)	102
Red spruce (<u>Picea rubens</u> Sarg.)	103
White spruce (<u>Picea glauca</u> (Moench) Voss.)	104
Balsam fir (<u>Abies balsamea</u> (L.) (Mill.))	105
Softwoods	106
Poplar spp. (<u>Populus</u>)	107
White birch (<u>Betula papyrifera</u> Marsh.)	108
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Hardwoods	110

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.7	3.8	3.9	4.1	4.2	4.4
10	6.9	7.4	7.7	7.9	8.2	8.5	8.7
15	10.4	11.2	11.5	11.8	12.3	12.7	13.1
20	13.8	14.9	15.3	15.7	16.4	16.9	17.4
22	15.2	16.4	16.9	17.3	18.0	18.6	19.2
24	16.6	17.9	18.4	18.9	19.7	20.3	20.9
26	18.0	19.4	19.9	20.4	21.3	22.0	22.7
28	19.4	20.8	21.5	22.0	22.9	23.7	24.4
30	20.8	22.3	23.0	23.6	24.6	25.4	26.2
32	22.1	23.8	24.5	25.1	26.2	27.1	27.9
34	23.5	25.3	26.0	26.7	27.8	28.8	29.6
36	24.9	26.8	27.6	28.3	29.5	30.5	31.4
38	26.3	28.3	29.1	29.8	31.1	32.2	33.1
40	27.7	29.8	30.6	31.4	32.8	33.9	34.9
42	29.1	31.8	32.7	33.0	34.4	35.6	36.6
44	30.4	32.8	33.7	34.6	36.0	37.3	38.4
46	31.8	34.2	35.2	36.1	37.7	39.0	40.1
48	33.2	35.7	36.8	37.7	39.3	40.7	41.9
50	34.6	37.2	38.3	39.3	40.9	42.4	43.6
52	36.0	38.7	39.8	40.8	42.6	44.1	45.3
54	37.4	40.2	41.4	42.4	44.2	45.8	47.1
56	38.7	41.7	42.9	44.0	45.9	47.5	48.8
58	40.1	43.2	44.4	45.6	47.5	49.1	50.6
60	41.5	44.7	46.0	47.1	49.1	50.8	52.3
62	42.9	46.2	47.5	48.7	50.8	52.5	54.1
64	44.3	47.6	49.0	50.3	52.4	54.2	55.8
66	45.7	49.1	50.6	51.8	54.1	55.9	57.6
68	47.0	50.6	52.1	53.4	55.7	57.6	59.3
70	48.4	52.1	53.6	55.0	57.3	59.3	61.0
72	49.8	53.6	55.2	56.6	59.0	61.0	62.8
74	51.2	55.1	56.7	58.1	60.6	62.7	64.5
76	52.6	56.6	58.2	59.7	62.2	64.4	66.3
78	54.0	58.1	59.8	61.3	63.9	66.1	68.0
80	55.4	59.6	61.3	62.8	65.5	67.8	69.8
82	56.7	61.1	62.8	64.4	67.2	69.5	71.5
84	58.1	62.5	64.4	66.0	68.8	71.2	73.2
86	59.5	64.0	65.9	67.5	70.4	72.9	75.0
88	60.9	65.5	67.4	69.1	72.1	74.6	76.7
90	62.3	67.0	69.0	70.7	73.7	76.3	78.5

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.184

DATA SOURCE: 599 TREES FROM N.B., QUE., CNT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	4.0	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	9.0
15	11.2	11.9	12.1	12.4	12.8	13.1	13.4
20	15.0	15.8	16.2	16.5	17.0	17.5	17.9
22	16.4	17.4	17.8	18.1	18.7	19.2	19.5
24	17.9	19.0	19.4	19.8	20.4	21.0	21.5
26	19.4	20.6	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.1	23.8	24.5	25.1
30	22.4	23.7	24.3	24.7	25.6	26.2	26.9
32	23.9	25.3	25.9	26.4	27.3	28.0	28.6
34	25.4	26.9	27.5	28.0	29.0	29.7	30.4
36	26.9	28.5	29.1	29.7	30.7	31.5	32.2
38	28.4	29.9	30.7	31.3	32.4	33.2	34.0
40	29.9	31.6	32.3	33.0	34.1	35.0	35.8
42	31.4	33.2	34.0	34.6	35.8	36.7	37.6
44	32.9	34.8	35.6	36.3	37.5	38.5	39.4
46	34.4	36.4	37.2	37.9	39.2	40.2	41.2
48	35.9	38.0	38.8	39.6	40.9	42.0	43.0
50	37.4	39.5	40.4	41.2	42.6	43.7	44.8
52	38.9	41.1	42.0	42.7	44.3	45.5	46.5
54	40.4	42.7	43.7	44.5	46.0	47.2	48.3
56	41.9	44.3	45.3	46.2	47.7	49.0	50.1
58	43.4	45.9	46.9	47.8	49.4	50.7	51.7
60	44.9	47.4	48.5	49.5	51.1	52.5	53.7
62	46.3	49.0	49.9	51.1	52.8	54.2	55.5
64	47.8	50.6	51.7	52.7	54.5	56.0	57.3
66	49.3	52.2	53.4	54.4	56.2	57.7	59.1
68	50.8	53.8	55.0	56.0	57.9	59.5	60.9
70	52.3	55.3	56.6	57.7	59.6	61.2	62.7
72	53.8	56.9	58.2	59.3	61.3	63.0	64.4
74	55.3	58.5	59.8	61.0	63.0	64.7	66.2
76	56.8	60.1	61.4	62.6	64.7	66.5	68.0
78	58.3	61.7	63.1	64.3	66.4	68.2	69.8
80	59.8	63.3	64.7	65.9	68.1	70.0	71.6
82	61.3	64.8	66.3	67.6	69.8	71.7	73.4
84	62.8	66.4	67.9	69.2	71.5	73.5	75.2
86	64.3	68.0	69.5	70.9	73.2	75.2	77.0
88	65.8	69.6	71.1	72.5	74.9	77.0	78.8
90	67.3	71.2	72.8	74.2	76.7	78.7	80.6

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$

WHERE: D = DEHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.151

DATA SOURCE: 740 TREES FROM N.B..QUE., ONT.

JACK PINE / PINUS BANKSIANA LAMB.
DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	4.0	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	9.0
15	11.2	11.9	12.1	12.4	12.8	13.1	13.4
20	15.0	15.8	16.2	16.5	17.0	17.5	17.9
22	16.4	17.4	17.3	18.1	18.7	19.2	19.7
24	17.9	19.0	19.4	19.8	20.4	21.0	21.5
26	19.4	20.6	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.1	23.8	24.5	25.1
30	22.4	23.7	24.3	24.7	25.6	26.2	26.9
32	23.9	25.3	25.9	26.4	27.3	28.0	28.6
34	25.4	26.9	27.5	28.0	29.0	29.7	30.4
36	26.9	28.5	29.1	29.7	30.7	31.5	32.2
38	28.4	30.0	30.7	31.3	32.4	33.2	34.0
40	29.9	31.6	32.3	33.0	34.1	35.0	35.8
42	31.4	33.2	34.0	34.6	35.8	36.7	37.6
44	32.9	34.8	35.6	36.3	37.5	38.5	39.4
46	34.4	36.4	37.2	37.9	39.2	40.2	41.2
48	35.9	38.0	38.8	39.6	40.9	42.0	43.0
50	37.4	39.5	40.4	41.2	42.6	43.7	44.8
52	38.9	41.1	42.0	42.9	44.3	45.5	46.5
54	40.4	42.7	43.7	44.5	46.0	47.2	48.3
56	41.9	44.3	45.3	46.2	47.7	49.0	50.1
58	43.4	45.9	46.9	47.8	49.4	50.7	51.9
60	44.9	47.4	48.5	49.5	51.1	52.5	53.7
62	46.3	49.0	50.1	51.1	52.8	54.2	55.5
64	47.8	50.6	51.7	52.7	54.5	56.0	57.3
66	49.3	52.2	53.4	54.4	56.2	57.7	59.1
68	50.8	53.8	55.0	56.0	57.9	59.5	60.9
70	52.3	55.3	56.6	57.7	59.6	61.2	62.7
72	53.8	56.9	58.2	59.3	61.3	63.0	64.4
74	55.3	58.5	59.8	61.0	63.0	64.7	66.2
76	56.8	60.1	61.4	62.6	64.7	66.5	68.0
78	58.3	61.7	63.1	64.3	66.4	68.2	69.8
80	59.8	63.3	64.7	65.9	68.1	70.0	71.6
82	61.3	64.8	66.3	67.6	69.8	71.7	73.4
84	62.8	66.4	67.9	69.2	71.5	73.5	75.2
86	64.3	68.0	69.5	70.9	73.2	75.2	77.0
88	65.8	69.6	71.1	72.5	74.9	77.0	78.8
90	67.3	71.2	72.8	74.2	76.7	78.7	80.6

EQUATION: D = DS((1+B2*LOG((S+0.3048)/(1.6754)))/(1-0.04365*B2))
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.151

DATA SOURCE: 1472 TREES FROM GUE., CNT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.0	4.2	4.3	4.3	4.4	4.5	4.6
10	8.0	8.4	8.5	8.6	8.8	9.0	9.2
15	12.0	12.5	12.8	12.9	13.3	13.5	13.8
20	16.1	16.7	17.0	17.3	17.7	18.0	18.4
22	17.7	18.4	18.7	19.0	19.5	19.9	20.2
24	19.3	20.1	20.4	20.7	21.2	21.7	22.0
26	20.9	21.8	22.1	22.4	23.0	23.5	23.9
28	22.5	23.4	23.8	24.2	24.8	25.3	25.7
30	24.1	25.1	25.5	25.9	26.5	27.1	27.5
32	25.7	26.8	27.2	27.6	28.3	28.9	29.4
34	27.3	28.4	28.9	29.3	30.1	30.7	31.2
36	28.9	30.1	30.6	31.1	31.8	32.5	33.1
38	30.5	31.8	32.3	32.8	33.6	34.3	34.9
40	32.1	33.5	34.0	34.5	35.4	36.1	36.7
42	33.7	35.1	35.7	36.2	37.1	37.9	38.6
44	35.3	36.8	37.4	38.0	38.9	39.7	40.4
46	36.9	38.5	39.1	39.7	40.7	41.5	42.2
48	38.5	40.2	40.8	41.4	42.4	43.3	44.1
50	41.8	43.5	44.2	44.9	46.0	46.9	47.7
52	43.4	45.2	45.9	46.6	47.7	48.7	49.6
54	45.0	46.9	47.6	48.3	49.5	50.5	51.4
56	46.6	48.5	49.3	50.0	51.3	52.3	53.3
58	48.2	50.2	51.0	51.8	53.1	54.1	55.1
60	49.8	51.9	52.7	53.5	54.8	55.9	56.9
62	51.4	53.5	54.4	55.2	56.6	57.8	58.8
64	53.0	55.2	56.1	56.9	58.4	59.6	60.6
66	54.6	56.9	57.8	58.7	60.1	61.4	62.4
68	56.2	58.6	59.5	60.4	61.9	63.2	64.3
70	57.8	60.2	61.2	62.1	63.7	65.0	66.1
72	59.4	61.9	62.9	63.8	65.4	66.8	67.9
74	61.0	63.6	64.6	65.6	67.2	68.6	69.8
76	62.6	65.3	66.3	67.3	69.0	70.4	71.6
78	64.2	66.9	68.0	69.0	70.7	72.2	73.5
80	65.8	68.6	69.7	70.8	72.5	74.0	75.3
82	67.4	70.3	71.4	72.5	74.3	75.8	77.1
84	69.1	72.0	73.1	74.2	76.0	77.6	79.0
86	70.7	73.6	74.8	75.9	77.8	79.4	80.8
88	72.3	75.3	76.5	77.7	79.6	81.2	82.6
90							

EQUATION: $D = DS((1+B2*LCG((S+0.3048)/1.6764))/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.118

DATA SOURCE: 748 TREES FROM ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)
 BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.6	3.9	4.0	4.0	4.2	4.3	4.4
10	7.3	7.7	7.9	8.1	8.4	8.6	8.9
15	10.9	11.6	11.9	12.1	12.6	13.0	13.3
20	14.5	15.4	15.8	16.2	16.8	17.3	17.7
24	17.0	17.4	17.4	17.8	18.5	19.0	19.5
26	18.5	18.5	19.0	19.4	20.1	20.7	21.3
28	18.9	20.1	20.6	21.0	21.8	22.5	23.0
30	21.3	21.6	22.2	22.7	23.5	24.2	24.8
32	21.8	24.7	25.8	24.3	25.2	25.9	26.6
34	23.2	24.7	25.3	25.9	26.8	27.4	28.4
36	24.7	26.3	26.9	27.5	28.5	29.4	30.1
38	26.1	27.8	28.5	29.1	30.2	31.1	31.9
40	27.0	29.4	30.1	30.7	31.9	32.8	33.7
42	29.0	32.4	33.3	34.0	35.2	36.3	37.4
44	30.5	34.0	34.8	35.6	36.9	38.0	39.0
46	33.4	37.1	38.4	39.2	40.5	41.5	42.5
48	34.8	38.0	39.6	40.4	41.9	43.2	44.3
50	36.3	40.2	41.2	42.1	43.6	44.9	46.1
52	37.7	41.7	42.8	43.7	45.3	46.7	47.8
54	39.0	43.3	44.3	45.3	47.0	48.4	49.6
56	42.1	44.8	45.9	46.9	48.7	50.1	51.4
58	43.5	46.3	47.5	48.5	50.3	51.8	53.2
60	45.0	47.9	49.1	50.2	52.0	53.6	54.9
62	46.4	49.4	50.7	51.8	53.7	55.3	56.7
64	47.9	51.0	52.3	53.4	55.4	57.0	58.5
66	49.3	52.5	53.8	55.0	57.0	58.8	60.2
68	50.8	54.1	55.4	56.6	58.7	60.5	62.0
70	52.2	55.6	57.0	58.2	60.4	62.2	63.8
72	53.7	57.2	58.6	59.9	62.1	63.9	65.6
74	55.1	58.7	60.2	61.5	63.7	65.7	67.3
76	56.6	60.3	61.8	63.1	65.4	67.4	69.1
78	58.0	61.8	63.3	64.7	67.1	69.1	70.9
80	59.5	63.3	64.9	66.3	68.8	70.9	72.7
82	61.0	64.9	66.5	68.0	70.5	72.6	74.4
84	62.4	66.4	68.1	69.6	72.1	74.3	76.2
86	63.9	68.0	69.7	71.2	73.8	76.0	78.0
88	65.3	69.5	71.3	72.8	75.5	77.8	79.7

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = C.164

DATA SOURCE: 723 TREES FROM NFLD., N.B., QUE., CNT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.6	3.8	3.9	4.0	4.2	4.3	4.4
10	7.2	7.7	7.9	8.0	8.3	8.6	8.8
15	10.8	11.5	11.8	12.0	12.5	12.9	13.2
20	14.3	15.3	15.7	16.1	16.7	17.2	17.6
22	15.8	16.8	17.3	17.7	18.3	18.9	19.4
24	17.2	18.4	18.8	19.3	20.0	20.6	21.2
26	18.6	19.9	20.4	20.9	21.7	22.4	23.1
28	20.1	21.4	22.0	22.5	23.3	24.1	24.7
30	21.5	23.0	23.6	24.1	25.0	25.8	26.5
32	23.0	24.5	25.1	25.7	26.7	27.5	28.2
34	24.4	26.0	26.7	27.3	28.4	29.2	30.0
36	25.8	27.6	28.3	28.9	30.0	31.0	31.8
38	27.3	29.1	29.8	30.5	31.7	32.7	33.5
40	28.7	30.6	31.4	32.1	33.4	34.4	35.3
42	30.1	32.2	33.0	33.7	35.0	36.1	37.1
44	31.6	33.7	34.6	35.3	36.7	37.8	38.8
46	33.0	35.2	36.1	36.9	38.4	39.6	40.6
48	34.4	36.7	37.7	38.5	40.0	41.3	42.4
50	35.9	38.3	39.3	40.2	41.7	43.0	44.1
52	37.3	39.8	40.8	41.8	43.4	44.7	45.9
54	38.7	41.3	42.4	43.4	45.0	46.4	47.7
56	40.2	42.9	44.0	45.0	46.7	48.2	49.4
58	41.6	44.4	45.5	46.6	48.4	49.9	51.2
60	43.0	45.9	47.1	48.2	50.0	51.6	52.9
62	44.5	47.5	48.7	49.8	51.7	53.3	54.7
64	45.9	49.0	50.3	51.4	53.0	55.0	56.5
66	47.3	50.5	51.8	53.0	55.0	56.8	58.2
68	48.8	52.1	53.4	54.6	56.7	58.5	60.0
70	50.2	53.6	55.0	56.2	58.4	60.2	61.8
72	51.6	55.1	56.5	57.8	60.0	61.9	63.5
74	53.1	56.6	58.1	59.4	61.7	63.6	65.3
76	54.5	58.2	59.7	61.0	63.4	65.4	67.1
78	55.9	59.7	61.3	62.6	65.0	67.1	68.8
80	57.4	61.2	62.8	64.2	66.7	68.8	70.6
82	58.8	62.8	64.4	65.9	68.4	70.5	72.4
84	60.2	64.3	66.0	67.5	70.0	72.2	74.1
86	61.7	65.8	67.5	69.1	71.7	74.0	75.9
88	63.1	67.4	69.1	70.7	73.4	75.7	77.7
90	64.5	68.9	70.7	72.3	75.0	77.4	79.4

EQUATION: $D = DS((1+B2*LOG((S+0.3648)/1.6764))/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.169

DATA SOURCE: 73 TREES FROM N.B.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MCENCH) VDSS

DDBE CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.8	3.9	4.0	4.1	4.3	4.4
10	7.1	7.6	7.8	7.9	8.3	8.5	8.8
15	10.6	11.3	11.6	11.9	12.4	12.8	13.2
20	14.1	15.1	15.5	15.9	16.5	17.1	17.6
22	15.5	16.6	17.1	17.5	18.2	18.8	19.3
24	16.9	18.1	18.6	19.1	19.8	20.5	21.1
26	18.3	19.6	20.2	20.7	21.5	22.2	22.8
28	19.8	21.2	21.7	22.3	23.2	23.9	24.6
30	21.2	22.7	23.3	23.8	24.8	25.6	26.3
32	22.6	24.2	24.8	25.4	26.5	27.3	28.1
34	24.0	25.7	26.4	27.0	28.1	29.0	29.8
36	25.4	27.2	27.9	28.6	29.8	30.7	31.6
38	26.8	28.7	29.5	30.2	31.4	32.5	33.3
40	28.2	30.2	31.1	31.8	33.1	34.2	35.1
42	29.6	31.7	32.6	33.4	34.7	35.9	36.9
44	31.0	33.3	34.2	35.0	36.4	37.6	38.6
46	32.4	34.8	35.7	36.6	38.0	39.3	40.4
48	33.9	36.3	37.3	38.2	39.7	41.0	42.1
50	35.3	37.8	38.8	39.7	41.3	42.7	43.9
52	36.7	39.3	40.4	41.3	43.0	44.4	45.6
54	38.1	40.8	41.9	42.9	44.7	46.1	47.4
56	39.5	42.3	43.5	44.5	46.3	47.8	49.1
58	40.9	43.8	45.0	46.1	48.0	49.5	50.9
60	42.3	45.3	46.6	47.7	49.6	51.2	52.7
62	43.7	46.9	48.1	49.3	51.3	53.0	54.4
64	45.1	48.4	49.7	50.9	52.9	54.7	56.2
66	46.6	49.9	51.2	52.5	54.6	56.4	57.7
68	48.0	51.4	52.8	54.1	56.2	58.1	59.7
70	49.4	52.9	54.3	55.6	57.9	59.8	61.4
72	50.8	54.4	55.9	57.2	59.5	61.5	63.2
74	52.2	55.9	57.5	58.8	61.2	63.2	64.9
76	53.6	57.4	59.0	60.4	62.8	64.9	66.7
78	55.0	58.9	60.6	62.0	64.5	66.6	68.5
80	56.4	60.5	62.1	63.6	66.2	68.3	70.2
82	57.8	62.0	63.7	65.2	67.8	70.0	72.0
84	59.3	63.5	65.2	66.8	69.5	71.7	73.7
86	60.7	65.0	66.8	68.4	71.1	73.4	75.5
88	62.1	66.5	68.3	69.9	72.8	75.2	77.2
90	63.5	68.0	69.9	71.5	74.4	76.9	79.0

EQUATION: D = DS((1+B2*LCG((S+0.3048)/1.6764))/(1-0.04365*B2))
 *WHERE: D = DEHCB ; OS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.176

DATA SOURCE: 646 TREES FROM N.B., QUE., CNT., MAN., SASK., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

D50E CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	3.9	4.0	4.1	4.3	4.4	4.5
10	7.5	7.9	8.1	8.2	8.5	8.7	8.9
15	11.2	11.8	12.1	12.3	12.8	13.1	13.4
20	14.9	15.8	16.1	16.5	17.0	17.5	17.9
22	16.4	17.4	17.8	18.1	18.7	19.2	19.7
24	17.9	18.9	19.4	19.8	20.4	21.0	21.5
26	19.4	20.5	21.0	21.4	22.1	22.7	23.3
28	20.9	22.1	22.6	23.0	23.8	24.5	25.0
30	22.4	23.7	24.2	24.7	25.5	26.2	26.8
32	23.9	25.3	25.8	26.3	27.2	28.0	28.6
34	25.4	26.8	27.4	28.0	28.9	29.7	30.4
36	26.8	28.4	29.1	29.6	30.6	31.5	32.2
38	28.3	30.0	30.7	31.3	32.3	33.2	34.0
40	29.8	31.6	32.3	32.9	34.0	35.0	35.8
42	31.3	33.1	33.9	34.6	35.7	36.7	37.6
44	32.8	34.7	35.5	36.2	37.4	38.5	39.4
46	34.3	36.3	37.1	37.9	39.1	40.2	41.1
48	35.8	37.9	38.7	39.5	40.8	42.0	42.9
50	37.3	39.5	40.4	41.2	42.5	43.7	44.7
52	38.8	41.0	42.0	42.8	44.2	45.5	46.5
54	40.3	42.6	43.6	44.4	45.9	47.2	48.3
56	41.8	44.2	45.2	46.1	47.6	48.9	50.1
58	43.3	45.8	46.8	47.7	49.3	50.7	51.9
60	44.7	47.4	48.4	49.4	51.0	52.4	53.7
62	46.2	48.9	50.0	51.0	52.7	54.2	55.5
64	47.7	50.5	51.7	52.7	54.4	55.9	57.2
66	49.2	52.1	53.3	54.3	56.1	57.7	59.0
68	50.7	53.7	54.9	56.0	57.8	59.4	60.8
70	52.2	55.2	56.5	57.6	59.5	61.2	62.6
72	53.7	56.8	58.1	59.3	61.2	62.9	64.4
74	55.2	58.4	59.7	60.9	63.0	64.7	66.2
76	56.7	60.0	61.3	62.5	64.7	66.4	68.0
78	58.2	61.6	63.0	64.2	66.4	68.2	69.8
80	59.7	63.1	64.6	65.8	68.1	69.9	71.6
82	61.2	64.7	66.2	67.5	69.8	71.7	73.3
84	62.6	66.3	67.8	69.1	71.5	73.4	75.1
86	64.1	67.9	69.4	70.8	73.2	75.2	76.9
88	65.6	69.5	71.0	72.4	74.9	76.9	78.7
90	67.1	71.0	72.6	74.1	76.6	78.7	80.5

EQUATION: $D = DS((1 + 92 * LCG(S + 0.3048) / 1.6764)) / (1 - 0.04365 * B2)$

WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.152

DATA SOURCE: 355 TREES FROM NFD..N.B.. QUE.. MAN.. SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

SOFTWOODS

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.7	3.9	4.0	4.1	4.2	4.4	4.5
10	7.4	7.9	8.0	8.2	8.5	8.7	8.9
15	11.1	11.8	12.0	12.3	12.7	13.1	13.4
20	14.8	15.7	16.1	16.4	17.0	17.4	17.8
22	16.3	17.3	17.7	18.0	18.6	19.2	19.6
24	17.8	18.8	19.3	19.7	20.3	20.9	21.4
26	19.3	20.4	20.9	21.3	22.0	22.7	23.2
28	20.7	22.0	22.5	22.9	23.7	24.4	25.0
30	22.2	23.6	24.1	24.6	25.4	26.1	26.8
32	23.7	25.1	25.7	26.2	27.1	27.9	28.6
34	25.2	26.7	27.3	27.9	28.8	29.6	30.3
36	26.7	28.3	28.9	29.5	30.5	31.4	32.1
38	28.1	29.8	30.5	31.1	32.2	33.1	33.9
40	29.6	31.4	32.1	32.8	33.9	34.9	35.7
42	31.1	33.0	33.7	34.4	35.6	36.6	37.5
44	32.6	34.5	35.3	36.1	37.3	38.3	39.3
46	34.1	36.1	36.9	37.7	39.0	40.1	41.0
48	35.6	37.7	38.6	39.3	40.7	41.8	42.8
50	37.0	39.3	40.2	41.0	42.4	43.6	44.6
52	38.5	40.8	41.8	42.6	44.1	45.3	46.4
54	40.0	42.4	43.4	44.3	45.8	47.1	48.2
56	41.5	44.0	45.0	45.9	47.5	48.8	50.0
58	43.0	45.5	46.6	47.5	49.2	50.6	51.8
60	44.4	47.1	48.2	49.2	50.9	52.3	53.5
62	45.9	48.7	49.8	50.8	52.6	54.0	55.3
64	47.4	50.2	51.4	52.4	54.3	55.8	57.1
66	48.9	51.8	53.0	54.1	55.9	57.5	58.9
68	50.4	53.4	54.6	55.7	57.6	59.3	60.7
70	51.9	55.0	56.2	57.4	59.3	61.0	62.5
72	53.3	56.5	57.8	59.0	61.0	62.8	64.2
74	54.8	58.1	59.4	60.6	62.7	64.5	66.0
76	56.3	59.7	61.0	62.3	64.4	66.2	67.8
78	57.8	61.2	62.7	63.9	66.1	68.0	69.6
80	59.3	62.8	64.3	65.6	67.8	69.7	71.4
82	60.7	64.4	65.9	67.2	69.5	71.5	73.2
84	62.2	65.9	67.5	68.8	71.2	73.2	75.0
86	63.7	67.5	69.1	70.5	72.9	75.0	76.7
88	65.2	69.1	70.7	72.1	74.6	76.7	78.5
90	66.7	70.7	72.3	73.8	76.3	78.4	80.3

EQUATION: $D = DS((1+82*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$
 WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LOG = NATURAL LOGARITHM ;
 B2 = 0.155

DATA SOURCE: 5356 TREES FROM CENTRAL AND EASTERN CANADA

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

PCPLAR / POPULUS SPP.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5				4.3	4.4	4.5	4.6
10	3.9	4.1	4.2	4.3	4.4	4.5	4.6
15	7.9	8.2	8.4	8.5	8.8	8.9	9.1
20	11.8	12.4	12.6	12.8	13.1	13.4	13.7
22	15.8	16.5	16.8	17.0	17.5	17.9	18.2
24	17.9	18.1	18.5	18.8	19.3	19.7	20.1
26	18.5	19.8	20.1	20.5	21.0	21.5	21.9
28	20.5	21.4	21.8	22.2	22.8	23.3	23.7
30	22.1	23.1	23.5	23.9	24.5	25.1	25.5
32	23.6	24.7	25.2	25.6	26.3	26.8	27.4
34	25.2	26.4	26.8	27.3	28.0	28.6	29.2
36	26.8	28.0	28.5	29.0	29.8	30.4	31.0
38	28.4	29.7	30.2	30.7	31.5	32.2	32.8
40	29.9	31.3	31.9	32.4	33.3	34.0	34.7
42	31.5	33.0	33.6	34.1	35.0	35.8	36.5
44	33.1	34.6	35.2	35.8	36.5	37.6	38.3
46	34.7	36.3	36.9	37.5	38.5	39.4	40.1
48	36.2	37.9	38.6	39.2	40.3	41.2	41.9
50	37.8	41.2	41.9	42.6	43.8	44.7	45.6
52	41.0	42.5	43.3	44.3	45.5	46.5	47.4
54	42.5	44.1	45.0	46.0	47.3	48.3	49.2
56	44.1	46.1	47.0	47.7	49.0	50.1	51.1
58	45.7	47.8	48.7	49.4	50.8	51.9	52.9
60	47.3	49.4	50.3	51.1	52.5	53.7	54.7
62	48.8	51.7	52.7	54.5	56.3	57.5	58.5
64	50.4	54.4	55.4	56.3	58.0	59.1	60.2
66	52.0	56.0	57.1	58.0	59.7	60.9	62.0
68	53.6	57.7	58.7	59.7	61.3	62.6	63.8
70	55.2	59.3	60.4	61.4	63.0	64.4	65.7
72	56.7	61.0	62.1	63.1	64.8	66.2	67.5
74	58.3	62.6	63.8	64.8	66.5	68.0	69.3
76	59.9	64.3	65.4	66.5	68.3	69.8	71.1
78	61.5	65.9	67.1	68.2	70.0	71.6	72.9
80	64.6	67.6	68.8	69.9	71.8	73.4	74.8
82	66.2	69.2	70.5	71.6	73.5	75.2	76.6
84	67.8	70.9	72.2	73.3	75.3	77.0	78.4
86	69.3	72.5	73.8	75.0	77.0	78.8	80.2
90	70.9	74.2	75.5	76.7	78.8	80.5	82.1

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$
 WHERE: D = DBHOB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.127

DATA SOURCE: 541 TREES FROM QUE., CNT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE BIRCH / BETULA PAPIRIFERA MARSH.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.8	3.9	4.0	4.1	4.3	4.4
10	7.1	7.6	7.8	7.9	8.3	8.5	8.8
15	10.6	11.3	11.6	11.9	12.4	12.8	13.2
20	14.1	15.1	15.5	15.9	16.5	17.1	17.6
22	15.5	16.6	17.1	17.5	18.2	18.8	19.3
24	16.9	18.1	18.6	19.1	19.8	20.5	21.1
26	18.3	19.6	20.2	20.7	21.5	22.2	22.8
28	19.8	21.2	21.7	22.3	23.2	23.9	24.6
30	21.2	22.7	23.3	23.8	24.8	25.6	26.3
32	22.6	24.2	24.8	25.4	26.5	27.3	28.1
34	24.0	25.7	26.4	27.0	28.1	29.0	29.8
36	25.4	27.2	27.9	28.6	29.8	30.7	31.6
38	26.8	28.7	29.5	30.2	31.4	32.5	33.3
40	28.2	30.2	31.1	31.8	33.1	34.2	35.1
42	29.6	31.7	32.6	33.4	34.7	35.9	36.9
44	31.0	33.3	34.2	35.0	36.4	37.6	38.6
46	32.4	34.8	35.7	36.6	38.0	39.3	40.4
48	33.9	36.3	37.3	38.2	39.7	41.0	42.1
50	35.3	37.8	38.8	39.7	41.3	42.7	43.9
52	36.7	39.3	40.4	41.3	43.0	44.4	45.6
54	38.1	40.8	41.9	42.9	44.7	46.1	47.4
56	39.5	42.3	43.5	44.5	46.3	47.8	49.1
58	40.9	43.8	45.0	46.1	48.0	49.5	50.9
60	42.3	45.3	46.6	47.7	49.6	51.2	52.7
62	43.7	46.9	48.1	49.3	51.3	53.0	54.4
64	45.1	48.4	49.7	50.9	52.9	54.7	56.2
66	46.6	49.9	51.2	52.5	54.6	56.4	57.9
68	48.0	51.4	52.8	54.1	56.2	58.1	59.7
70	49.4	52.9	54.3	55.6	57.9	59.8	61.4
72	50.8	54.4	55.9	57.2	59.5	61.5	63.2
74	52.2	55.9	57.5	58.8	61.2	63.2	64.9
76	53.6	57.4	59.0	60.4	62.8	64.7	66.7
78	55.0	58.9	60.6	62.0	64.5	66.6	68.5
80	56.4	60.5	62.1	63.6	66.2	68.3	70.2
82	57.8	62.0	63.7	65.2	67.8	70.0	72.0
84	59.3	63.5	65.2	66.8	69.5	71.7	73.7
86	60.7	65.0	66.8	68.4	71.1	73.4	75.5
88	62.1	66.5	68.3	69.9	72.8	75.2	77.2
90	63.5	68.0	69.9	71.5	74.4	76.9	79.0

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.0436S*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.176

DATA SOURCE: 149 TREES FROM GUE., GNT., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)
 YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.5	3.7	3.8	3.9	4.1	4.2	4.4
10	7.0	7.5	7.7	7.9	8.2	8.5	8.7
15	10.5	11.2	11.5	11.8	12.3	12.7	13.1
20	13.9	15.0	15.4	15.8	16.4	17.0	17.5
22	15.3	16.5	16.9	17.4	18.1	18.7	19.2
24	16.7	18.0	18.5	18.9	19.7	20.4	21.0
26	18.1	19.5	20.0	20.5	21.4	22.1	22.7
28	19.5	21.0	21.6	22.1	23.0	23.8	24.5
30	20.9	22.5	23.1	23.7	24.7	25.5	26.2
32	22.3	24.0	24.6	25.2	26.3	27.2	28.0
34	23.7	25.5	26.2	26.8	27.9	28.9	29.7
36	25.1	27.0	27.7	28.4	29.6	30.6	31.5
38	26.5	28.5	29.3	30.0	31.2	32.5	33.2
40	27.9	29.9	30.8	31.6	32.9	34.0	35.0
42	29.3	31.4	32.3	33.1	34.5	35.7	36.7
44	30.7	32.9	33.9	34.7	36.2	37.4	38.5
46	32.1	34.4	35.4	36.3	37.8	39.1	40.2
48	33.5	35.9	37.0	37.9	39.5	40.8	42.0
50	34.9	37.4	38.5	39.4	41.1	42.5	43.7
52	36.2	38.9	40.0	41.0	42.7	44.2	45.5
54	37.6	40.4	41.6	42.6	44.4	45.9	47.2
56	39.0	41.9	43.1	44.2	46.0	47.6	48.9
58	40.4	43.4	44.7	45.8	47.7	49.3	50.7
60	41.8	44.9	46.2	47.3	49.3	51.0	52.4
62	43.2	46.4	47.7	48.9	51.0	52.7	54.2
64	44.6	47.9	49.3	50.5	52.6	54.4	55.9
66	46.0	49.4	50.8	52.1	54.2	56.1	57.7
68	47.4	50.9	52.4	53.7	55.9	57.8	59.4
70	48.8	52.4	53.9	55.2	57.5	59.5	61.2
72	50.2	53.9	55.4	56.8	59.2	61.2	62.9
74	51.6	55.4	57.0	58.4	60.8	62.9	64.7
76	53.0	56.9	58.5	60.0	62.5	64.6	66.4
78	54.4	58.4	60.1	61.5	64.1	66.3	68.2
80	55.8	59.9	61.6	63.1	65.8	68.0	69.9
82	57.1	61.4	63.1	64.7	67.4	69.7	71.7
84	58.5	62.9	64.7	66.3	69.0	71.4	73.4
86	59.9	64.4	66.2	67.9	70.7	73.1	75.2
88	61.3	65.9	67.8	69.4	72.3	74.8	76.9
90	62.7	67.4	69.3	71.0	74.0	76.5	78.7

EQUATION: $D = DS((1+B2*LOG(S+0.3048)/1.6764)/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = C.181

DATA SOURCE: ISI TREES FROM GUE.. CNT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

HARDWOODS

DSOB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	3.8	4.0	4.1	4.2	4.3	4.4	4.5
10	7.6	8.0	8.2	8.3	8.6	8.8	9.0
15	11.4	12.0	12.3	12.5	12.9	13.6	13.5
20	15.2	16.0	16.3	16.6	17.2	17.6	18.0
22	16.7	17.6	18.0	18.3	18.9	19.4	19.8
24	18.2	19.2	19.6	19.9	20.6	21.1	21.6
26	19.7	20.8	21.2	21.6	22.3	22.6	23.4
28	21.2	22.4	22.8	23.3	24.0	24.4	25.2
30	22.7	24.0	24.5	24.9	25.7	26.4	27.0
32	24.2	25.6	26.1	26.6	27.4	28.2	28.8
34	25.8	27.2	27.7	28.3	29.0	29.9	30.6
36	27.3	28.8	29.4	29.9	30.6	31.7	32.4
38	28.8	30.4	31.0	31.6	32.6	33.4	34.2
40	30.3	32.0	32.6	33.2	34.5	35.5	36.0
42	31.8	33.6	34.3	34.9	36.0	37.0	37.8
44	33.3	35.2	35.9	36.6	37.7	38.7	39.6
46	34.8	36.8	37.5	38.2	39.4	40.5	41.4
48	36.4	38.4	39.2	39.9	41.2	42.2	43.0
50	37.9	40.0	40.8	41.6	42.9	44.0	45.0
52	39.4	41.5	42.4	43.2	44.6	45.8	46.8
54	40.9	43.1	44.1	44.9	46.3	47.5	48.6
56	42.4	44.7	45.7	46.5	48.0	49.3	50.4
58	43.9	46.3	47.3	48.2	49.7	51.0	52.2
60	45.5	47.9	49.0	49.9	51.5	52.8	54.0
62	47.0	49.5	50.6	51.5	53.2	54.6	55.8
64	48.5	51.1	52.2	53.2	54.9	56.3	57.6
66	50.0	52.7	53.9	54.9	56.6	58.1	59.4
68	51.5	54.3	55.5	56.5	58.3	59.8	61.2
70	53.0	55.9	57.1	58.2	60.0	61.6	63.0
72	54.5	57.5	58.8	59.8	61.7	63.4	64.7
74	56.1	59.1	60.4	61.5	63.5	65.1	66.5
76	57.6	60.7	62.0	63.2	65.2	66.9	68.3
78	59.1	62.3	63.6	64.8	66.9	68.6	70.1
80	60.6	63.9	65.3	66.5	68.6	70.4	71.9
82	62.1	65.5	66.9	68.2	70.3	72.2	73.7
84	63.6	67.1	68.5	69.8	72.0	73.9	75.5
86	65.2	68.7	70.2	71.5	73.8	75.7	77.3
88	66.7	70.3	71.8	73.1	75.5	77.4	79.1
90	68.2	71.9	73.4	74.8	77.2	79.2	80.9

EQUATION: $D = DS((1+B2*LOG((S+0.3048)/(1.6764)))/(1-0.04365*B2))$
 WHERE: D = DBHCB ; DS = STUMP DIAMETER OUTSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.145

DATA SOURCE: 841 TREES FROM QUE., CNT., MAN., SASK., ALTA.

**APPENDIX VI Stump Diameter Inside Bark Using Diameter
Breast Height Outside Bark**

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STUMP DIAMETER INSIDE BARK (CM)
EASTERN WHITE PINE / PINUS STROBUS L.

DEHOB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.5	2.4	2.3	2.3	2.2	2.2	2.2	1.9
4	4.9	4.7	4.6	4.6	4.4	4.4	4.4	3.7
6	7.4	7.1	6.9	6.8	6.6	6.6	6.5	5.5
8	9.8	9.4	9.3	9.1	8.8	8.8	8.6	7.4
10	12.3	11.8	11.6	11.6	11.0	10.9	10.7	9.2
12	14.8	14.1	13.9	13.6	13.2	13.0	12.9	11.0
14	17.2	16.5	16.2	15.9	15.4	15.0	14.7	12.9
16	19.7	18.8	18.5	18.2	17.6	17.2	16.8	14.7
18	22.1	21.2	20.8	20.4	19.8	19.4	18.9	16.5
20	24.6	23.5	23.1	22.7	22.0	21.6	20.9	18.4
22	27.0	25.9	25.4	25.0	24.2	23.6	23.0	20.4
24	29.5	28.2	27.7	27.2	26.4	25.7	25.1	22.0
26	31.9	30.6	30.0	29.5	28.6	27.9	27.2	23.9
28	34.4	32.9	32.3	31.7	30.8	30.0	29.3	25.7
30	36.8	35.2	34.6	34.0	33.0	32.1	31.4	27.5
32	39.3	37.6	36.9	36.3	35.2	34.3	33.5	29.4
34	41.7	39.9	39.2	38.5	37.4	36.4	35.6	31.2
36	44.2	42.3	41.5	40.8	39.6	38.6	37.7	33.0
38	46.6	44.6	43.8	43.1	41.8	40.7	39.8	34.9
40	49.1	47.0	46.1	45.3	44.0	42.8	41.9	36.7
42	51.6	49.3	48.4	47.6	46.2	45.0	43.9	38.5
44	54.0	51.7	50.7	49.9	48.4	47.1	46.0	40.2
46	56.5	54.0	53.0	52.1	50.6	49.3	48.1	42.0
48	58.9	56.4	55.3	54.4	52.8	51.4	50.2	44.0
50	61.4	58.7	57.6	56.7	55.0	53.5	52.3	45.9
52	63.8	61.1	59.9	58.9	57.2	55.7	54.4	47.7
54	66.3	63.4	62.2	61.2	59.4	57.8	56.5	49.5
56	68.7	65.8	64.5	63.5	61.6	60.0	58.6	51.4
58	71.2	68.1	66.8	65.7	63.8	62.1	60.7	53.2
60	73.6	70.5	69.2	68.0	66.0	64.3	62.8	55.0
62	76.1	72.8	71.5	70.2	68.2	66.4	64.9	56.9
64	78.5	75.1	73.8	72.5	70.4	68.5	66.9	58.7
66	81.0	77.5	76.1	74.8	72.6	70.7	69.0	60.5
68	83.4	79.8	78.4	77.0	74.8	72.8	71.1	62.4
70	85.9	82.2	80.7	79.3	76.9	75.0	73.2	64.2
72	88.3	84.5	83.0	81.6	79.1	77.1	75.3	66.0
74	90.8	86.9	85.3	83.8	81.3	79.2	77.4	67.9

EQUATION: $DSI = B3 + D(1 - 0.04365 * E2)(B4 + B5 * \text{LOG}(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHOB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.184 ; B3 = 0.036 ; B4 = 0.916 ; B5 = 0.188

DATA SOURCE: 1158 TREES FROM N.B. QUE. CNT.

STUMP DIAMETER INSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DEHCB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.5	2.4	2.4	2.4	2.3	2.3	2.3	2.0
4	4.8	4.7	4.6	4.5	4.4	4.3	4.3	3.8
6	7.1	6.9	6.8	6.7	6.5	6.4	6.3	5.7
8	9.5	9.1	9.0	8.9	8.7	8.5	8.3	7.5
10	11.8	11.4	11.2	11.0	10.8	10.5	10.3	9.3
12	14.1	13.6	13.4	13.2	12.9	12.6	12.4	11.2
14	16.4	15.8	15.6	15.4	15.0	14.7	14.4	13.0
16	18.7	18.1	17.8	17.5	17.1	16.7	16.4	14.8
18	21.0	20.3	20.0	19.7	19.2	18.8	18.5	16.5
20	23.3	22.5	22.2	21.9	21.3	20.9	20.5	18.3
22	25.7	24.7	24.4	24.0	23.4	23.0	22.5	20.1
24	28.0	27.0	26.6	26.2	25.6	25.0	24.6	22.1
26	30.3	29.2	28.8	28.4	27.8	27.1	26.6	23.8
28	32.6	31.4	31.0	30.5	29.9	29.2	28.6	25.9
30	34.9	33.7	33.2	32.7	32.0	31.3	30.7	27.6
32	37.2	35.9	35.4	34.9	34.0	33.4	32.7	29.4
34	39.6	38.1	37.6	37.0	36.1	35.4	34.7	31.3
36	41.9	40.4	39.8	39.2	38.2	37.4	36.7	33.1
38	44.2	42.6	41.9	41.4	40.4	39.5	38.8	34.9
40	46.5	44.8	44.1	43.5	42.5	41.6	40.8	36.7
42	48.8	47.1	46.3	45.7	44.6	43.6	42.8	38.6
44	51.1	49.3	48.5	47.9	46.7	45.7	44.9	40.4
46	53.4	51.5	50.7	50.0	48.8	47.8	46.9	42.2
48	55.8	53.8	52.9	52.2	50.9	49.8	48.9	44.0
50	58.1	56.0	55.1	54.4	53.0	51.9	50.9	45.9
52	60.4	58.2	57.3	56.5	55.2	54.0	53.0	47.7
54	62.7	60.5	59.5	58.7	57.3	56.1	55.0	49.5
56	65.0	62.7	61.7	60.9	59.4	58.1	57.0	51.3
58	67.3	64.9	63.9	63.0	61.5	60.2	59.1	53.2
60	69.7	67.2	66.1	65.2	63.6	62.3	61.1	55.0
62	72.0	69.4	68.3	67.4	65.7	64.4	63.1	56.8
64	74.3	71.6	70.5	69.5	67.8	66.4	65.1	58.7
66	76.6	73.8	72.7	71.7	69.9	68.5	67.2	60.5
68	78.9	76.1	74.9	73.9	72.1	70.5	69.2	62.3
70	81.2	78.3	77.1	76.0	74.2	72.6	71.2	64.1
72	83.5	80.5	79.3	78.2	76.3	74.7	73.3	65.9
74	85.9	82.8	81.5	80.4	78.4	76.7	75.3	67.8

EQUATION: $DSI = B3 + D(1 - 0.04365 * B2) * (B4 + B5 * LOG(1.6764 / (S + C.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.151 ; B3 = 0.196 ; B4 = 0.913 ; B5 = 0.148

DATA SOURCE: 1480 TREES FROM N.B. QUE. ONT.

JACK PINE / PINUS BANKSIANA LAMB.
STUMP DIAMETER INSIDE BARK (CM)

DEHCB CLASS (CM)	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.5
4	4.2	4.0	4.0	3.9	3.8	3.8	3.7	3.4
6	6.5	6.3	6.4	6.1	6.0	6.0	5.8	5.3
8	8.8	8.5	8.4	8.3	8.1	8.0	7.9	7.2
10	11.1	10.8	10.6	10.5	10.3	10.1	10.0	9.1
12	13.4	13.0	12.8	12.7	12.4	12.3	12.0	11.0
14	15.7	15.2	15.1	14.9	14.6	14.3	14.1	13.0
16	18.0	17.5	17.3	17.1	16.7	16.4	16.2	14.8
18	20.3	19.7	19.5	19.3	18.9	18.6	18.3	16.7
20	22.6	22.0	21.7	21.5	21.0	20.7	20.4	18.7
22	24.9	24.2	23.9	23.6	23.2	22.8	22.4	20.7
24	27.2	26.5	26.1	25.8	25.3	24.9	24.5	22.6
26	29.5	28.7	28.3	28.0	27.5	27.0	26.6	24.5
28	31.8	30.9	30.5	30.2	29.6	29.1	28.7	26.4
30	34.1	33.2	32.8	32.4	31.8	31.2	30.8	28.3
32	36.4	35.4	35.0	34.6	33.9	33.3	32.9	30.2
34	38.7	37.7	37.2	36.8	36.1	35.5	34.9	32.1
36	41.0	39.9	39.4	39.0	38.2	37.7	37.0	34.0
38	43.3	42.2	41.6	41.2	40.4	39.9	39.1	36.0
40	45.6	44.4	43.8	43.4	42.5	41.8	41.2	37.9
42	47.9	46.6	46.1	45.6	44.7	43.9	43.3	39.8
44	50.2	48.9	48.3	47.7	46.8	46.0	45.4	41.7
46	52.5	51.1	50.5	49.9	49.0	48.1	47.4	43.6
48	54.8	53.4	52.7	52.1	51.1	50.2	49.5	45.5
50	57.1	55.6	54.9	54.3	53.3	52.4	51.6	47.4
52	59.4	57.8	57.1	56.5	55.4	54.5	53.7	49.3
54	61.7	60.1	59.4	58.7	57.6	56.6	55.7	51.2
56	64.0	62.3	61.6	60.9	59.7	58.7	57.9	53.1
58	66.3	64.6	63.8	63.1	61.8	60.8	59.9	55.0
60	68.6	66.8	66.0	65.3	64.0	62.9	62.0	56.9
62	70.9	69.1	68.2	67.5	66.1	65.0	64.1	58.8
64	73.2	71.3	70.4	69.6	68.1	67.0	66.1	60.7
66	75.5	73.5	72.6	71.8	70.3	69.3	68.3	62.6
68	77.8	75.8	74.9	74.0	72.6	71.4	70.3	64.5
70	80.1	78.0	77.1	76.2	74.7	73.5	72.4	66.4
72	82.4	80.3	79.3	78.4	76.9	75.6	74.5	68.3
74	84.7	82.5	81.5	80.6	79.0	77.7	76.6	70.2

EQUATION: $DSI = B3 + D(1 - C \cdot C4365 \cdot B2)(B4 + B5 \cdot \text{LOG}(1.6764 / (S + C \cdot 3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK; D = DEHCB;
 S = STUMP HEIGHT; LCG = NATURAL LOGARITHM;
 B2 = 0.151; B3 = -0.455; B4 = 0.961; B5 = 0.118

DATA SOURCE: 2944 TREES FROM GUE., CNT., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DEHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.0	1.9	1.9	1.9	1.8	1.8	1.6
4	4.3	4.2	4.1	4.1	4.0	3.9	3.5
6	6.9	6.6	6.3	6.2	6.1	6.0	5.5
8	8.9	8.6	8.5	8.4	8.3	8.1	7.4
10	11.5	10.9	10.8	10.6	10.4	10.3	9.3
12	13.5	13.1	13.0	12.8	12.6	12.4	11.5
14	15.8	15.4	15.2	15.0	14.7	14.5	13.2
16	18.1	17.6	17.4	17.2	16.9	16.6	15.1
18	20.4	19.9	19.6	19.4	19.0	18.7	17.0
20	22.7	22.1	21.8	21.6	21.2	20.8	19.0
22	25.1	24.4	24.1	23.8	23.3	23.0	20.9
24	27.4	26.6	26.3	26.0	25.5	25.1	22.8
26	29.7	28.8	28.5	28.2	27.7	27.3	24.7
28	32.0	31.1	30.7	30.4	29.8	29.3	26.6
30	34.3	33.3	32.9	32.6	32.0	31.4	28.6
32	36.6	35.6	35.1	34.8	34.1	33.6	30.6
34	38.9	37.8	37.4	37.0	36.3	35.7	32.5
36	41.2	40.1	39.6	39.2	38.4	37.8	34.4
38	43.5	42.3	41.8	41.4	40.6	39.9	36.4
40	45.8	44.5	44.0	43.5	42.7	42.0	38.3
42	48.1	46.8	46.2	45.7	44.9	44.2	40.2
44	50.5	49.0	48.5	47.9	47.0	46.3	42.2
46	52.8	51.3	50.7	50.1	49.2	48.4	44.1
48	55.1	53.5	52.9	52.3	51.3	50.5	46.0
50	57.4	55.8	55.1	54.5	53.5	52.6	48.0
52	59.7	58.0	57.3	56.7	55.6	54.7	49.9
54	62.0	60.3	59.5	58.9	57.8	56.9	51.8
56	64.3	62.5	61.8	61.1	60.0	59.0	53.7
58	66.6	64.7	64.0	63.3	62.1	61.1	55.6
60	68.9	67.0	66.2	65.5	64.3	63.2	57.5
62	71.2	69.2	68.4	67.7	66.4	65.3	59.4
64	73.5	71.5	70.6	69.9	68.6	67.5	61.3
66	75.9	73.7	72.9	72.1	70.7	69.6	63.2
68	78.2	76.0	75.1	74.3	72.9	71.7	65.1
70	80.5	78.2	77.3	76.5	75.0	73.8	67.0
72	82.8	80.5	79.5	78.7	77.2	75.9	68.9
74	85.1	82.7	81.7	80.9	79.3	78.0	70.8

EQUATION: $DSI = B2 + D(1 - C.C4365 * B2)(B4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGarithm ;
 B2 = 0.118 ; B3 = -0.338 ; B4 = 0.966 ; B5 = 0.114

DATA SOURCE: 2110 TREES FROM ALTA.

STUMP DIAMETER INSIDE BARK (CM)
 BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DEHGB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.0	1.9	1.9	1.8	1.8	1.7	1.7
4	4.5	4.3	4.2	4.2	4.0	3.9	3.8
6	7.0	6.7	6.6	6.5	6.3	6.1	6.0
8	9.5	9.1	8.9	8.8	8.5	8.3	8.2
10	11.9	11.5	11.3	11.1	10.8	10.5	10.3
12	14.4	13.9	13.6	13.4	13.1	12.8	12.5
14	16.9	16.3	16.0	15.7	15.3	15.0	14.6
16	19.4	18.6	18.3	18.1	17.6	17.2	16.8
18	21.9	21.0	20.7	20.4	19.8	19.4	19.0
20	24.4	23.4	23.0	22.7	22.1	21.6	21.1
22	26.9	25.8	25.4	25.0	24.3	23.8	23.3
24	29.3	28.2	27.7	27.3	26.6	26.0	25.5
26	31.8	30.6	30.1	29.6	28.9	28.2	27.6
28	34.3	33.0	32.4	32.0	31.1	30.4	29.8
30	36.8	35.4	34.8	34.3	33.4	32.6	31.9
32	39.3	37.8	37.1	36.6	35.6	34.8	34.1
34	41.8	40.2	39.5	38.9	37.9	37.0	36.3
36	44.2	42.5	41.8	41.2	40.1	39.2	38.4
38	46.7	44.9	44.2	43.5	42.4	41.4	40.6
40	49.1	47.3	46.5	45.9	44.6	43.6	42.7
42	51.5	49.7	48.9	48.2	46.9	45.8	44.9
44	54.0	52.1	51.3	50.5	49.2	48.0	47.1
46	56.4	54.5	53.6	52.8	51.4	50.2	49.2
48	58.9	56.9	56.0	55.1	53.7	52.4	51.4
50	61.3	59.3	58.3	57.4	55.9	54.7	53.5
52	63.8	61.7	60.7	59.8	58.2	56.9	55.7
54	66.2	64.1	63.0	62.1	60.4	59.1	57.9
56	68.7	66.4	65.4	64.4	62.7	61.3	60.0
58	71.1	68.8	67.7	66.7	65.0	63.5	62.2
60	73.6	71.2	70.1	69.0	67.2	65.7	64.4
62	76.0	73.6	72.4	71.3	69.5	67.9	66.5
64	78.5	76.0	74.8	73.7	71.7	70.1	68.7
66	81.0	78.4	77.1	76.0	74.0	72.3	70.8
68	83.5	80.8	79.5	78.3	76.2	74.5	73.0
70	86.0	83.2	81.8	80.6	78.5	76.7	75.2
72	88.5	85.6	84.2	82.9	80.7	78.9	77.3
74	91.0	88.0	86.5	85.2	83.0	81.1	79.5

EQUATION: $DSI = B3 + D(1 - 0.04365 * E2) * (B4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.164 ; B3 = -0.478 ; B4 = 0.965 ; B5 = 0.168

DATA SOURCE: 1766 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SAEG.

DEHOB CLASS (CM)	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.7
4	4.9	4.7	4.6	4.5	4.4	4.3	4.2	3.6
6	7.5	7.1	7.0	6.9	6.7	6.5	6.5	5.5
8	10.0	9.6	9.4	9.2	8.9	8.7	8.5	7.4
10	12.5	12.0	11.8	11.6	11.2	10.9	10.7	9.4
12	15.1	14.4	14.2	13.9	13.5	13.2	12.9	11.3
14	17.6	16.9	16.6	16.3	15.8	15.4	15.0	13.2
16	20.2	19.3	18.9	18.6	18.1	17.6	17.2	15.1
18	22.7	21.7	21.3	21.0	20.4	19.8	19.4	17.0
20	25.3	24.2	23.7	23.3	22.6	21.5	21.1	18.9
22	27.8	26.6	26.1	25.7	24.9	24.3	23.7	20.8
24	30.4	29.1	28.5	28.0	27.2	26.5	25.9	22.7
26	32.9	31.5	30.9	30.4	29.5	28.7	28.1	24.6
28	35.4	33.9	33.3	32.7	31.8	31.0	30.2	26.5
30	38.0	36.4	35.7	35.1	34.1	33.2	32.4	28.4
32	40.5	38.8	38.1	37.4	36.3	35.4	34.6	30.3
34	43.1	41.2	40.5	39.8	38.6	37.6	36.8	32.2
36	45.6	43.7	42.9	42.1	40.9	39.8	38.9	34.1
38	48.2	46.1	45.3	44.5	43.2	42.1	41.1	36.0
40	50.7	48.5	47.7	46.9	45.5	44.3	43.3	38.0
42	53.3	51.0	50.0	49.2	47.7	46.5	45.5	39.9
44	55.8	53.4	52.4	51.6	50.0	48.7	47.6	41.8
46	58.4	55.9	54.8	53.9	52.3	51.0	49.8	43.7
48	60.9	58.3	57.2	56.3	54.6	53.2	52.0	45.6
50	63.4	60.7	59.6	58.6	56.9	55.4	54.1	47.5
52	66.0	63.2	62.0	61.0	59.2	57.6	56.3	49.4
54	68.5	65.6	64.4	63.3	61.4	59.9	58.5	51.3
56	71.1	68.0	66.8	65.7	63.7	62.1	60.7	53.3
58	73.6	70.5	69.2	68.0	66.0	64.3	62.8	55.2
60	76.2	72.9	71.6	70.4	68.3	66.5	65.0	57.1
62	78.7	75.3	74.0	72.7	70.6	68.8	67.2	59.0
64	81.3	77.8	76.4	75.1	72.9	71.0	69.4	60.9
66	83.8	80.2	78.7	77.4	75.1	73.2	71.5	62.8
68	86.3	82.7	81.1	79.8	77.4	75.4	73.7	64.7
70	88.9	85.1	83.5	82.1	79.7	77.7	75.9	66.6
72	91.4	87.5	85.9	84.5	82.0	79.9	78.0	68.5
74	94.0	90.0	88.3	86.8	84.3	82.1	80.2	70.4

EQUATION: $DSI = B3 + D(1 - C \cdot 0.4365 * E2)(B4 + B5 * LOG(1.6764 / (S + C \cdot 3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHOB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.169 ; B3 = -0.185 ; B4 = 0.953 ; B5 = 0.193

DATA SOURCE: 146 TREES FROM N.B.

WHITE SPRUCE / PICEA GLAUCA (MCENCH) VOSS
STUMP DIAMETER INSIDE BARK (CM)

DEHCB CLASS (CM)	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	1.8	1.6	1.6	1.6	1.5	1.4	1.4	1.1
4	6.9	6.6	6.5	6.4	6.2	6.0	5.8	3.1
6	9.5	9.1	8.9	8.8	8.5	8.3	8.1	5.0
8	12.1	11.6	11.4	11.2	10.8	10.6	10.3	7.0
10	14.7	14.1	13.8	13.6	13.2	12.8	12.5	9.0
12	17.3	16.6	16.3	16.0	15.5	15.1	14.8	11.0
14	19.9	19.1	18.7	18.4	17.9	17.4	17.0	14.9
16	22.5	21.6	21.2	20.8	20.2	19.7	19.2	16.9
20	25.1	24.0	23.6	23.2	22.5	22.0	21.5	18.9
22	27.7	26.5	26.0	25.6	24.9	24.2	23.7	18.9
24	30.3	29.0	28.5	28.0	27.2	26.5	25.9	20.8
26	32.9	31.5	30.9	30.4	29.5	28.8	28.1	22.8
28	35.5	34.0	33.4	32.8	31.9	31.1	30.4	24.7
30	38.1	36.5	35.8	35.2	34.2	33.4	32.6	26.7
32	40.7	39.0	38.3	37.6	36.6	35.6	34.8	28.7
34	43.3	41.5	40.7	40.0	38.9	37.9	37.1	30.7
36	45.9	44.0	43.2	42.5	41.2	40.2	39.3	32.6
38	48.5	46.4	45.6	44.9	43.6	42.5	41.5	34.6
40	51.1	48.9	48.1	47.3	45.9	44.7	43.7	36.6
42	53.7	51.4	50.5	49.7	48.2	47.0	46.0	38.5
44	56.3	53.9	52.9	52.1	50.6	49.3	48.2	40.5
46	58.9	56.4	55.4	54.5	52.9	51.6	50.4	42.5
48	61.5	58.9	57.8	56.9	55.3	53.9	52.7	44.4
50	64.0	61.4	60.3	59.3	57.6	56.1	54.9	46.4
52	66.6	63.9	62.7	61.7	59.9	58.4	57.1	48.4
54	69.2	66.4	65.2	64.1	62.3	60.7	59.4	50.4
56	71.8	68.8	67.6	66.5	64.6	63.0	61.6	52.3
58	74.4	71.3	70.1	68.9	66.9	65.3	63.8	54.3
60	77.0	73.8	72.5	71.3	69.3	67.5	66.0	56.3
62	79.6	76.3	74.9	73.7	71.6	69.8	68.3	58.2
64	82.2	78.8	77.4	76.1	74.0	72.1	70.5	60.2
66	84.8	81.3	79.8	78.5	76.3	74.4	72.7	62.2
68	87.4	83.8	82.3	80.9	78.6	76.7	75.0	64.1
70	90.0	86.3	84.7	83.3	81.0	78.9	77.2	66.1
72	92.6	88.8	87.2	85.8	83.3	81.2	79.4	68.1
74	95.2	91.2	89.6	88.2	85.6	83.5	81.7	70.1
74	95.2	91.2	89.6	88.2	85.6	83.5	81.7	72.0

EQUATION: DSI = B3+D(1-C.04365*E2)(B4+B5*LOG(1.6764/(S+0.3048)))
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.176 ; B3 = -0.843 ; B4 = 0.984 ; B5 = 0.190

DATA SOURCE: 1292 TREES FROM N.B., QUE., CNT., MAN., SASK., ALTA.

STUMP DIAMETER INSIDE BARK (CM)

BALSAM FIR / ABIES BALSAMEA (L.) MILL.

DBHCB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.0	1.9	1.9	1.9	1.8	1.8	1.8	1.6
4	4.0	4.2	4.1	4.1	4.0	4.0	4.0	3.5
6	6.0	6.5	6.4	6.3	6.2	6.1	6.0	5.4
8	8.0	8.7	8.6	8.5	8.3	8.2	8.1	7.4
10	10.0	11.0	10.9	10.7	10.5	10.3	10.1	9.3
12	12.0	13.3	13.1	13.0	12.7	12.4	12.2	11.2
14	14.0	15.6	15.3	15.2	14.8	14.6	14.3	13.0
16	16.0	17.8	17.6	17.4	17.0	16.7	16.4	15.0
18	18.0	20.1	19.8	19.6	19.2	18.8	18.5	17.0
20	20.0	22.4	22.1	21.8	21.4	21.0	20.6	18.9
22	22.0	24.6	24.3	24.0	23.5	23.1	22.7	20.8
24	24.0	26.9	26.6	26.2	25.7	25.2	24.8	22.7
26	26.0	29.2	28.8	28.4	27.9	27.4	26.9	24.7
28	28.0	31.4	31.0	30.7	30.2	29.5	29.0	26.6
30	30.0	33.7	33.3	32.9	32.2	31.6	31.1	28.5
32	32.0	36.0	35.5	35.1	34.4	33.7	33.2	30.4
34	34.0	38.3	37.8	37.3	36.5	35.9	35.3	32.3
36	36.0	40.5	40.0	39.5	38.7	38.0	37.4	34.3
38	38.0	42.8	42.2	41.7	40.9	40.1	39.5	36.2
40	40.0	45.1	44.5	43.9	43.0	42.3	41.6	38.1
42	42.0	47.3	46.7	46.2	45.2	44.4	43.7	40.0
44	44.0	49.6	49.0	48.4	47.4	46.5	45.8	42.9
46	46.0	51.9	51.2	50.6	49.5	48.7	47.9	44.8
48	48.0	54.1	53.4	52.8	51.7	50.8	50.0	46.7
50	50.0	56.4	55.7	55.0	53.9	52.9	52.1	48.6
52	52.0	58.7	57.9	57.2	56.0	55.0	54.2	50.5
54	54.0	61.0	60.2	59.4	58.2	57.2	56.3	52.4
56	56.0	63.2	62.4	61.7	60.4	59.3	58.4	54.3
58	58.0	65.5	64.6	63.9	62.6	61.4	60.5	56.2
60	60.0	67.8	66.9	66.1	64.7	63.6	62.6	58.1
62	62.0	70.0	69.1	68.3	66.9	65.7	64.7	60.0
64	64.0	72.3	71.4	70.5	69.1	67.8	66.8	61.9
66	66.0	74.6	73.6	72.7	71.2	70.0	68.8	63.8
68	68.0	76.9	75.8	74.9	73.4	72.1	70.9	65.7
70	70.0	79.1	78.1	77.2	75.6	74.2	73.0	67.6
72	72.0	81.4	80.3	79.4	77.7	76.3	75.1	69.5
74	74.0	83.6	82.6	81.6	79.9	78.5	77.2	71.4

EQUATION: $DSI = B3 + D(1 - C.04365 * E2) * (B4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.152 ; B3 = -0.333 ; B4 = 0.962 ; B5 = 0.127

DATA SOURCE: 2316 TREES FROM NFD., N.B., CUE., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)

SOFTWOODS

DEHCB CLASS (CM)	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.1	2.0	1.9	1.9	1.9	1.8	1.8	1.6
4	4.4	4.3	4.2	4.2	4.0	4.0	4.0	3.5
6	6.8	6.6	6.5	6.4	6.2	6.1	6.1	5.4
8	9.2	8.9	8.8	8.6	8.4	8.2	8.2	7.3
10	11.6	11.2	11.0	10.9	10.6	10.4	10.4	9.2
12	14.0	13.5	13.3	13.1	12.8	12.5	12.5	11.1
14	16.4	15.8	15.6	15.4	15.0	14.7	14.7	13.0
16	18.8	18.1	17.6	17.6	17.2	17.8	17.8	16.8
18	21.2	20.4	20.1	19.8	19.4	19.0	19.0	18.7
20	23.5	22.7	22.4	22.1	21.6	21.1	21.1	20.6
22	25.9	25.0	24.7	24.3	23.7	23.3	23.3	22.8
24	28.3	27.6	26.9	26.6	25.9	25.4	25.4	24.9
26	30.7	29.9	29.2	28.8	28.1	27.5	27.5	27.0
28	33.1	31.9	31.5	31.0	30.3	29.7	29.7	29.2
30	35.5	34.2	33.7	33.3	32.5	31.8	31.8	31.4
32	37.9	36.6	36.0	35.5	34.7	34.0	34.0	33.6
34	40.3	38.9	38.3	37.8	36.9	36.1	36.1	35.5
36	42.6	41.2	40.6	40.0	39.1	38.3	38.3	37.6
38	45.0	43.5	42.8	42.3	41.3	40.4	40.4	39.7
40	47.4	45.8	45.1	44.5	43.4	42.6	42.6	41.8
42	49.8	48.1	47.4	46.7	45.6	44.7	44.7	43.9
44	52.2	50.4	49.6	49.0	47.8	46.8	46.8	46.0
46	54.6	52.7	51.9	51.2	50.0	49.0	49.0	48.1
48	57.0	55.0	54.2	53.5	52.2	51.1	51.1	50.2
50	59.4	57.3	56.5	55.7	54.4	53.3	53.3	52.3
52	61.7	59.6	58.7	57.9	56.6	55.4	55.4	54.4
54	64.1	61.9	61.0	60.2	58.8	57.6	57.6	56.5
56	66.5	64.2	63.3	62.4	61.0	59.7	59.7	58.6
58	68.9	66.5	65.5	64.7	63.1	61.9	61.9	60.7
60	71.3	68.8	67.8	66.9	65.3	64.0	64.0	62.8
62	73.7	71.1	70.1	69.1	67.5	66.1	66.1	65.0
64	76.1	73.4	72.4	71.4	69.7	68.3	68.3	67.1
66	78.5	75.7	74.6	73.6	71.9	70.4	70.4	69.2
68	80.8	78.0	76.9	75.9	74.1	72.6	72.6	71.3
70	83.2	80.4	79.2	78.1	76.3	74.7	74.7	73.4
72	85.6	82.7	81.4	80.4	78.5	76.9	76.9	75.5
74	88.0	85.0	83.7	82.6	80.7	79.0	79.0	77.6

EQUATION: $DSI = B3 + D(1 - 0.04365 * E2) / (D4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.155 ; B3 = -0.332 ; B4 = 0.953 ; B5 = 0.146

DATA SOURCE: 13252 TREES FROM CENTRAL AND EASTERN CANADA

STUMP DIAMETER INSIDE BARK (CM)

POPLAR / POPULUS SPP.

DEHCB CLASS (CM)	STUMP HEIGHT (M)									
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30		
2	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.2		
4	3.9	3.8	3.7	3.7	3.6	3.6	3.5	3.1		
6	6.2	6.0	5.9	5.9	5.7	5.6	5.5	5.1		
8	8.5	8.2	8.1	8.0	7.9	7.7	7.6	7.0		
10	10.8	10.5	10.3	10.2	10.0	9.9	9.8	8.9		
12	13.1	12.7	12.5	12.4	12.2	12.0	11.8	10.9		
14	15.4	14.9	14.7	14.6	14.3	14.1	13.9	12.8		
16	17.7	17.4	16.9	16.8	16.4	16.2	15.9	14.7		
18	19.9	19.4	19.2	18.9	18.6	18.3	18.0	16.6		
22	24.5	23.8	23.6	23.3	22.9	22.5	22.1	20.5		
24	26.8	26.1	25.8	25.5	25.0	24.6	24.3	22.4		
26	29.1	28.3	28.0	27.7	27.2	26.7	26.4	24.4		
28	31.4	30.5	30.2	29.9	29.3	28.8	28.4	26.3		
30	33.7	32.8	32.4	32.0	31.4	30.9	30.5	28.2		
32	36.0	35.0	34.6	34.2	33.6	33.0	32.6	30.1		
34	38.3	37.2	36.8	36.4	35.7	35.2	34.7	32.1		
36	40.6	39.5	39.0	38.6	37.9	37.3	36.7	34.0		
38	42.9	41.7	41.2	40.8	40.0	39.4	38.8	35.9		
40	45.2	43.9	43.4	43.0	42.2	41.5	40.9	37.8		
42	47.5	46.2	45.6	45.1	44.3	43.6	43.0	39.8		
44	49.8	48.4	47.8	47.3	46.4	45.7	45.1	41.7		
46	52.1	50.6	50.0	49.5	48.6	47.8	47.1	43.6		
48	54.4	52.9	52.2	51.7	50.7	49.9	49.2	45.6		
50	56.6	55.1	54.4	53.9	52.9	52.0	51.3	47.5		
52	58.9	57.3	56.6	56.0	55.0	54.1	53.4	49.4		
54	61.2	59.5	58.9	58.2	57.2	56.2	55.4	51.3		
56	63.5	61.8	61.1	60.4	59.3	58.3	57.5	53.3		
58	65.8	64.0	63.3	62.6	61.4	60.5	59.6	55.2		
60	68.1	66.2	65.5	64.8	63.6	62.6	61.7	57.1		
62	70.4	68.5	67.7	67.0	65.7	64.7	63.8	59.0		
64	72.7	70.7	69.9	69.1	67.9	66.7	65.8	61.0		
66	75.0	72.9	72.1	71.3	70.0	68.9	67.9	62.9		
68	77.3	75.2	74.3	73.5	72.1	71.0	70.0	64.8		
70	79.6	77.4	76.5	75.7	74.3	73.1	72.1	66.8		
72	81.9	79.6	78.7	77.9	76.4	75.2	74.2	68.7		
74	84.2	81.9	80.9	80.1	78.6	77.3	76.2	70.6		

EQUATION: $DSI = B3 + D(1 - 0.04365 * E2)(B4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.127 ; B3 = -0.693 ; B4 = 0.964 ; B5 = 0.111

DATA SOURCE: 1082 TREES FROM QUE., CNT., MAN., SASK.

STUMP DIAMETER INSIDE BARK (CM)

WHITE BIRCH / BETULA PAPYRIFERA MARSH.

DBHCB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
2	2.6	2.5	2.4	2.4	2.3	2.3	2.2
4	5.0	4.8	4.8	4.7	4.6	4.5	4.4
6	7.5	7.2	7.1	7.0	6.8	6.6	6.5
8	10.0	9.6	9.4	9.3	9.0	8.8	8.6
10	12.4	11.9	11.7	11.5	11.2	11.0	10.7
12	14.9	14.3	14.0	13.8	13.5	13.3	12.9
14	17.3	16.7	16.4	16.1	15.7	15.5	15.0
16	19.8	19.0	18.7	18.4	17.9	17.5	17.1
18	22.3	21.4	21.0	20.7	20.1	19.6	19.1
20	24.7	23.7	23.3	23.0	22.3	21.8	21.4
22	27.2	26.1	25.7	25.3	24.6	24.0	23.5
24	29.7	28.5	28.0	27.5	26.8	26.2	25.6
26	32.1	30.8	30.3	29.8	29.0	28.3	27.7
28	34.6	33.3	32.6	32.1	31.2	30.5	29.9
30	37.0	35.6	35.0	34.4	33.5	32.7	32.0
32	39.5	37.9	37.3	36.7	35.7	34.8	34.1
34	42.0	40.3	39.6	39.0	37.9	37.0	36.2
36	44.4	42.6	41.9	41.3	40.1	39.2	38.4
38	46.9	45.0	44.2	43.6	42.4	41.4	40.5
40	49.3	47.4	46.6	45.8	44.6	43.5	42.6
42	51.8	49.7	48.9	48.1	46.8	45.7	44.7
44	54.3	52.1	51.2	50.4	49.0	47.9	46.8
46	56.7	54.5	53.5	52.7	51.3	50.0	49.0
48	59.2	56.8	55.9	55.0	53.5	52.2	51.1
50	61.7	59.2	58.2	57.3	55.7	54.4	53.3
52	64.1	61.6	60.5	59.6	57.9	56.5	55.3
54	66.6	63.9	62.8	61.8	60.1	58.7	57.5
56	69.0	66.3	65.1	64.1	62.4	60.9	59.6
58	71.5	68.6	67.5	66.4	64.6	63.1	61.7
60	74.0	71.0	69.8	68.7	66.8	65.2	63.8
62	76.4	73.4	72.1	71.0	69.0	67.4	66.0
64	78.9	75.7	74.4	73.3	71.3	69.6	68.1
66	81.3	78.1	76.8	75.6	73.5	71.7	70.2
68	83.8	80.5	79.1	77.8	75.7	73.9	72.3
70	86.3	82.8	81.4	80.1	77.9	76.1	74.5
72	88.7	85.2	83.7	82.4	80.2	78.2	76.6
74	91.2	87.5	86.0	84.7	82.4	80.4	78.7

EQUATION: $DSI = B3 + D(1 - 0.04365 * B2)(B4 + B5 * \log(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.176 ; B3 = 0.112 ; B4 = 0.542 ; B5 = 0.175

DATA SOURCE: 298 TREES FROM GUE., CNT., ALTA.

STUMP DIAMETER INSIDE BARK (CM)
 YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DEHCB CLASS	STUMP HEIGHT (M)							
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
2	2.4	2.3	2.3	2.2	2.2	2.1	2.1	1.8
4	4.9	4.7	4.6	4.6	4.4	4.3	4.2	3.7
6	7.4	7.1	7.0	6.9	6.7	6.5	6.4	5.6
8	9.9	9.5	9.3	9.2	8.9	8.7	8.5	7.5
10	12.4	11.9	11.7	11.5	11.2	10.9	10.6	9.4
12	14.9	14.3	14.0	13.8	13.4	13.1	12.8	11.3
14	17.4	16.7	16.4	16.1	15.7	15.3	14.9	13.2
16	19.9	19.1	18.7	18.4	17.9	17.5	17.1	15.1
18	22.4	21.5	21.1	20.7	20.2	19.7	19.2	17.0
20	24.9	23.9	23.4	23.1	22.4	21.8	21.4	18.9
22	27.4	26.6	25.8	25.4	24.6	24.0	23.5	20.8
24	29.9	28.6	28.1	27.7	26.9	26.2	25.7	22.6
26	32.4	31.0	30.5	30.0	29.1	28.4	27.9	24.5
28	34.9	33.4	32.8	32.3	31.4	30.6	29.9	26.4
30	37.4	35.8	35.2	34.6	33.6	32.8	32.1	28.3
32	39.9	38.2	37.5	36.9	35.9	35.0	34.4	30.2
34	42.4	40.6	39.9	39.2	38.1	37.2	36.5	32.1
36	44.9	43.0	42.2	41.6	40.4	39.4	38.5	34.0
38	47.4	45.4	44.6	43.9	42.6	41.6	40.7	35.9
40	49.9	47.8	46.9	46.2	44.9	43.8	42.8	37.8
42	52.4	50.2	49.3	48.5	47.1	46.0	44.9	39.7
44	54.9	52.6	51.6	50.8	49.4	48.1	47.1	41.6
46	57.4	55.0	54.0	53.1	51.6	50.3	49.2	43.5
48	59.9	57.4	56.3	55.4	53.9	52.5	51.4	45.4
50	62.4	59.8	58.7	57.8	56.1	54.7	53.5	47.3
52	64.9	62.1	61.0	60.1	58.4	56.9	55.7	49.1
54	67.4	64.5	63.4	62.4	60.6	59.1	57.8	51.0
56	69.9	66.9	65.7	64.7	62.9	61.3	59.9	52.9
58	72.4	69.3	68.1	67.0	65.1	63.5	62.1	54.8
60	74.9	71.7	70.5	69.3	67.3	65.7	64.2	56.7
62	77.4	74.1	72.8	71.6	69.6	67.9	66.4	58.6
64	79.9	76.5	75.2	73.9	71.8	70.1	68.5	60.5
66	82.4	78.9	77.5	76.3	74.1	72.3	70.7	62.4
68	84.9	81.3	79.9	78.6	76.3	74.4	72.8	64.3
70	87.4	83.7	82.2	80.9	78.6	76.6	75.0	66.2
72	89.9	86.1	84.6	83.2	80.8	78.8	77.1	68.1
74	92.4	88.5	86.9	85.5	83.1	81.0	79.2	70.0

EQUATION: $DSI = B3 + D(1 - 0.04365 * E2)(E4 + B5 * LOG(1.6764 / (S + 0.3048)))$
 WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DEHCB ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.181 ; B3 = -0.071 ; B4 = 0.946 ; B5 = 0.183

DATA SOURCE: 302 TREES FROM QUE., CNT.

STUMP DIAMETER INSIDE BARK (CM)

HARDWOODS

DEHOB CLASS (CM)	STUMP HEIGHT (M)									
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30		
2	1.9	1.8	1.8	1.8	1.7	1.7	1.7	1.5		
4	4.3	4.1	4.1	4.0	3.9	3.8	3.8	3.4		
6	6.6	6.4	6.3	6.2	6.1	6.0	6.0	5.3		
8	9.0	8.7	8.6	8.5	8.3	8.1	8.0	7.2		
10	11.4	11.0	10.8	10.7	10.4	10.2	10.1	9.1		
12	13.7	13.3	13.1	12.9	12.6	12.4	12.3	11.0		
14	16.1	15.5	15.3	15.1	14.8	14.5	14.3	13.0		
16	18.4	17.8	17.6	17.4	17.0	16.6	16.4	14.9		
18	20.8	20.1	19.8	19.6	19.1	18.8	18.4	16.8		
20	23.5	22.4	22.1	21.8	21.3	20.9	20.5	18.7		
22	27.0	24.7	24.3	24.0	23.5	23.0	22.6	20.6		
24	27.9	27.0	26.6	26.2	25.7	25.2	24.7	22.5		
26	32.6	29.2	28.8	28.5	27.8	27.3	26.8	24.4		
28	34.9	31.5	31.1	30.7	30.0	29.4	28.9	26.4		
30	37.3	33.8	33.3	32.9	32.2	31.6	31.0	28.3		
32	39.7	36.1	35.6	35.1	34.4	33.7	33.1	30.2		
34	42.0	38.4	37.8	37.4	36.5	35.8	35.2	32.1		
36	44.4	40.7	40.1	39.6	38.7	38.0	37.3	34.0		
38	46.7	42.9	42.3	41.8	40.9	40.1	39.4	35.9		
40	49.1	45.2	44.6	44.0	43.1	42.2	41.5	37.8		
42	51.5	47.5	46.9	46.3	45.2	44.4	43.6	39.7		
44	53.8	49.8	49.1	48.5	47.4	46.5	45.7	41.7		
46	56.2	52.1	51.4	50.7	49.6	48.7	47.8	43.6		
48	58.5	54.4	53.6	52.9	51.8	50.8	49.9	45.5		
50	60.9	56.6	55.9	55.2	53.9	52.9	52.0	47.4		
52	63.3	58.9	58.1	57.4	56.1	55.1	54.1	49.3		
54	65.6	61.2	60.4	59.6	58.3	57.2	56.2	51.2		
56	68.0	63.5	62.6	61.8	60.5	59.3	58.3	53.1		
58	70.3	65.8	64.9	64.1	62.6	61.5	60.4	55.1		
60	72.7	68.1	67.1	66.3	64.8	63.6	62.5	57.0		
62	75.1	70.3	69.4	68.5	67.0	65.7	64.6	58.9		
64	77.4	72.6	71.6	70.7	69.2	67.9	66.7	60.8		
66	79.8	74.9	73.9	72.9	71.3	70.0	68.8	62.7		
68	82.1	77.2	76.1	75.2	73.5	72.1	70.9	64.6		
70	84.5	79.5	78.4	77.4	75.7	74.3	73.0	66.5		
72	86.9	81.8	80.6	79.6	77.9	76.4	75.1	68.5		
74		84.0	82.9	81.8	80.1	78.5	77.2	70.4		

EQUATION: $DSI = B3 + C(1 - 0.04365 * E2)(B4 + B5 * \text{LOG}(1.6764 / (S + 0.3048)))$

WHERE: DSI = STUMP DIAMETER INSIDE BARK ; D = DBHCB ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.145 ; B3 = -0.439 ; B4 = 0.957 ; B5 = 0.135

DATA SOURCE: 1682 TREES FROM GUE., CNT., MAN., SASK., ALTA.

**APPENDIX VII Diameter Breast Height Outside Bark Using Stump
Diameter Inside Bark**

SPECIES	PAGE
Eastern white pine (<u>Pinus strobus</u> L.)	126
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Lodgepole pine (<u>Pinus contorta</u> Dougl. var. <u>latifolia</u> Engelm.)	129
Black spruce (<u>Picea mariana</u> (Mill.) B.S.P.)	130
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White spruce (<u>Picea glauca</u> (Moench) Voss.)	132
Balsam fir (<u>Abies balsamea</u> (L.) (Mill.))	133
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White birch (<u>Betula papyrifera</u> Marsh.)	136
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DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

EASTERN WHITE PINE / PINUS STROBUS L.

DSIB CLASS (CM)	STUMP HEIGHT (M)							1.30
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
5	4.4	4.7	4.8	4.9	5.0	5.2	5.3	6.0
10	8.9	8.7	8.9	9.1	9.5	9.8	9.8	11.3
15	11.7	12.7	13.1	13.4	13.9	14.3	14.7	16.7
20	17.2	16.8	17.2	17.6	18.3	18.9	19.4	22.1
24	18.7	18.4	18.9	19.3	20.1	20.7	21.3	24.4
26	20.2	21.6	22.6	22.7	23.6	24.4	25.1	28.5
30	21.2	23.3	23.9	24.4	25.4	26.2	26.9	30.6
32	24.8	24.9	25.5	26.1	27.2	28.1	28.8	32.9
34	26.3	28.1	28.9	29.5	30.7	31.7	32.6	34.9
36	27.8	29.7	30.5	31.3	32.5	33.6	34.5	37.1
38	29.3	31.3	32.2	33.0	34.5	35.4	36.3	39.2
40	30.8	33.0	33.9	34.7	36.0	37.2	38.2	41.5
42	32.3	34.6	35.5	36.4	37.8	39.0	40.1	43.5
44	33.8	36.2	37.2	38.1	39.6	40.9	42.0	45.7
46	35.3	37.8	38.8	39.8	41.4	42.7	43.9	47.8
48	36.8	39.4	40.5	41.5	43.1	44.5	45.7	49.9
50	38.3	41.0	42.2	43.2	44.9	46.4	47.6	52.1
52	39.8	42.7	43.8	44.9	46.7	48.2	49.5	54.2
54	41.3	44.3	45.5	46.6	48.4	50.0	51.4	56.4
56	42.9	45.9	47.1	48.3	50.2	51.8	53.3	58.5
58	44.4	47.5	48.8	50.0	52.0	53.7	55.1	60.7
60	45.9	49.1	50.5	51.7	53.7	55.5	57.0	62.8
62	47.4	50.7	52.1	53.4	55.5	57.3	58.8	65.0
64	48.9	52.4	53.8	55.1	57.3	59.2	60.8	67.1
66	50.4	54.0	55.5	56.8	59.1	61.0	62.7	69.3
68	51.9	55.6	57.1	58.5	60.8	62.8	64.6	71.4
70	53.4	57.2	58.8	60.2	62.6	64.7	66.4	73.5
72	54.9	58.8	60.4	61.9	64.4	66.5	68.3	75.7
74	56.4	60.5	62.1	63.6	66.1	68.3	70.2	77.8
76	57.9	62.1	63.8	65.3	67.9	70.1	72.1	80.0
78	59.4	63.7	65.4	67.0	69.7	72.0	74.0	82.1
80	61.0	65.3	67.1	68.7	71.5	73.8	75.8	84.3
82	62.5	66.9	68.7	70.4	73.2	75.6	77.7	86.4
84	64.0	68.5	70.4	72.1	75.0	77.5	79.6	88.6
86	65.5	70.2	72.1	73.8	76.8	79.3	81.5	90.7
88	67.0	71.8	73.7	75.5	78.5	81.1	83.4	92.8
90	68.5	73.4	75.4	77.2	80.3	82.9	85.2	95.0
								97.1

EQUATION: D = (B6+DSI*(B7+B8*LOG((S+C*3048)/(1.6764))))/(1-0.04365*B2)
 #WHERE: D = DEHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.184 ; B6 = 0.617 ; B7 = 1.072 ; B8 = 0.190

DATA SOURCE: 1198 TREES FROM N.B., QUE., CNT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED PINE / PINUS RESINOSA AIT.

DSIE CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.3	4.5	4.6	4.7	4.8	4.9	5.0
10	8.4	8.9	9.0	9.2	9.5	9.7	9.9
15	12.6	13.2	13.5	13.7	14.1	14.5	14.8
20	16.7	17.6	18.0	18.3	18.7	19.3	19.7
22	18.4	19.3	19.7	20.1	20.7	21.2	21.6
24	20.1	21.1	21.5	21.9	22.6	23.1	23.6
26	21.7	22.8	23.3	23.7	24.4	25.0	25.6
28	23.4	24.6	25.1	25.5	26.3	26.9	27.5
30	25.0	26.3	26.9	27.3	28.2	28.9	29.5
32	26.7	28.1	28.6	29.2	30.0	30.8	31.4
34	28.4	29.8	30.4	31.0	31.9	32.7	33.4
36	30.0	31.6	32.2	32.8	33.8	34.6	35.3
38	31.7	33.3	34.0	34.6	35.6	36.5	37.3
40	33.3	35.1	35.8	36.4	37.5	38.4	39.2
42	35.0	36.8	37.6	38.2	39.4	40.3	41.2
44	36.7	38.6	39.3	40.0	41.1	42.1	43.2
46	38.3	40.3	41.1	41.8	43.1	44.2	45.1
48	40.0	42.0	42.7	43.5	45.0	46.1	47.1
50	41.6	43.8	44.7	45.5	46.8	48.0	49.0
52	43.3	45.5	46.5	47.3	48.7	49.9	51.0
54	45.0	47.3	48.2	49.1	50.6	51.8	52.9
56	46.6	49.0	50.0	50.9	52.5	53.7	54.9
58	48.3	50.8	51.8	52.7	54.3	55.7	56.8
60	49.9	52.5	53.6	54.5	56.2	57.6	58.8
62	51.6	54.3	55.4	56.4	58.1	59.5	60.7
64	53.3	56.0	57.2	58.2	59.9	61.4	62.7
66	54.9	57.8	58.9	60.0	61.8	63.3	64.7
68	56.6	59.5	60.7	61.8	63.7	65.2	66.6
70	58.2	61.3	62.5	63.6	65.5	67.2	68.6
72	59.9	63.0	64.3	65.4	67.4	69.1	70.5
74	61.6	64.8	66.1	67.2	69.3	71.0	72.5
76	63.2	66.5	67.8	69.0	71.1	72.9	74.4
78	64.9	68.2	69.6	70.9	73.0	74.8	76.4
80	66.5	70.0	71.4	72.7	74.9	76.7	78.3
82	68.2	71.7	73.2	74.5	76.7	78.6	80.3
84	69.9	73.5	75.0	76.3	78.6	80.6	82.3
86	71.5	75.2	76.8	78.1	80.5	82.5	84.2
88	73.2	77.0	78.5	79.9	82.3	84.4	86.2
90	74.8	78.7	80.3	81.7	84.2	86.3	88.1

EQUATION: D = (B6+DSI(B7+E8*LCG((S+0.3048)/1.6764)))/(1-0.04365*B2)
 WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.151 ; B6 = 0.135 ; B7 = 1.082 ; B8 = 0.151

DATA SOURCE: 1480 TREES FROM N.B., QUE., ONT.

JACK PINE / PINUS BANKSIANA LAMB.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

DSIB CLASS (CM)	STUMP HEIGHT (M)							1.30
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
5	4.9	5.1	5.1	5.2	5.3	5.4	5.5	5.9
10	9.1	9.4	9.5	9.7	9.9	10.0	10.2	11.0
15	13.2	13.7	13.9	14.1	14.4	14.7	14.9	16.2
20	17.4	18.1	18.3	18.6	19.0	19.4	19.7	21.3
24	19.1	19.8	20.1	20.4	20.8	21.2	21.6	23.4
26	20.7	21.5	21.8	22.1	22.7	23.1	23.5	25.4
28	22.4	23.3	23.6	23.9	24.5	25.0	25.4	27.5
30	24.1	25.0	25.4	25.7	26.3	26.8	27.3	29.5
32	25.7	26.7	27.1	27.5	28.1	28.7	29.1	31.6
34	27.4	28.5	28.9	29.3	30.0	30.5	31.0	33.6
36	29.0	30.2	30.7	31.1	31.8	32.4	32.9	35.7
38	30.7	31.9	32.4	32.9	33.6	34.3	34.8	37.8
40	32.4	33.7	34.2	34.6	35.4	36.1	36.7	39.8
42	34.0	35.4	35.9	36.4	37.3	38.0	38.6	41.9
44	35.7	37.1	37.5	38.2	39.1	39.9	40.5	43.9
46	37.4	38.8	39.5	40.0	40.9	41.7	42.4	46.0
48	39.0	40.6	41.2	41.8	42.8	43.6	44.3	48.0
50	40.7	42.3	43.0	43.6	44.6	45.5	46.2	50.1
52	42.4	44.0	44.7	45.3	46.4	47.3	48.1	52.2
54	44.0	45.8	46.5	47.1	48.2	49.2	50.0	54.3
56	45.7	47.5	48.3	48.9	50.1	51.0	51.9	56.3
58	47.4	49.2	50.0	50.7	51.9	52.9	53.8	58.3
60	49.0	51.0	51.8	52.5	53.7	54.8	55.7	60.4
62	50.7	52.7	53.5	54.3	55.6	56.6	57.6	62.4
64	52.4	54.4	55.3	56.1	57.4	58.5	59.5	64.5
66	54.0	56.2	57.1	57.8	59.2	60.4	61.4	66.6
68	55.7	57.9	58.8	59.6	61.0	62.2	63.3	68.6
70	57.4	59.6	60.6	61.4	62.9	64.1	65.1	70.7
72	59.0	61.4	62.3	63.2	64.7	65.9	67.0	72.7
74	60.7	63.1	64.1	65.0	66.5	67.8	68.9	74.8
76	62.4	64.8	65.9	66.8	68.3	69.7	70.8	76.8
78	64.0	66.6	67.6	68.6	70.2	71.5	72.7	78.9
80	65.7	68.3	69.4	70.3	72.0	73.4	74.6	81.0
82	67.4	70.0	71.1	72.1	73.8	75.3	76.5	83.0
84	69.0	71.8	72.9	73.9	75.7	77.1	78.4	85.1
86	70.7	73.5	74.7	75.7	77.5	79.0	80.3	87.1
88	72.4	75.2	76.4	77.5	79.3	80.9	82.2	89.2
90	74.0	77.0	78.2	79.3	81.1	82.7	84.1	91.2
	75.7	78.7	79.9	81.0	83.0	84.6	86.0	93.3

EQUATION: D = (B6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
 WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.151 ; B6 = 0.721 ; B7 = 1.027 ; B8 = 0.117

DATA SOURCE: 2944 TREES FROM GUE. CNT. MAN. SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)
 LODGEPOLE PINE / PINUS CONTORTA DOUGL. VAR. LATIFOLIA ENGELM.

DSIE CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.7	4.9	4.9	5.0	5.1	5.2	5.6
10	8.9	9.2	9.4	9.5	9.7	9.9	10.8
15	13.1	13.6	13.8	14.0	14.3	14.5	15.9
20	17.3	18.0	18.2	18.5	18.9	19.2	21.1
24	19.0	19.7	20.0	20.3	20.7	21.1	23.1
26	20.7	21.5	21.8	22.0	22.5	23.0	25.2
28	22.4	23.2	23.5	23.8	24.4	24.8	27.2
30	24.1	24.9	25.3	25.6	26.2	26.7	29.3
32	25.7	26.4	27.1	27.4	28.0	28.6	31.3
34	27.4	28.1	28.9	29.2	29.9	30.4	33.4
36	29.1	30.2	30.6	31.0	31.7	32.3	35.5
38	30.8	31.9	32.4	32.8	33.6	34.2	37.5
40	32.5	33.7	34.2	34.6	35.4	36.1	39.6
42	34.1	35.4	36.0	36.4	37.2	37.9	41.6
44	35.8	37.2	37.7	38.2	39.1	39.8	43.7
46	37.5	38.9	39.5	40.0	40.9	41.7	45.7
48	39.2	40.7	41.3	41.8	42.7	43.5	47.8
50	40.9	42.4	43.0	43.6	44.6	45.4	49.9
52	42.6	44.2	44.8	45.4	46.4	47.3	51.9
54	44.2	45.9	46.6	47.2	48.3	49.2	54.0
56	45.9	47.7	48.4	49.0	50.1	51.0	56.0
58	47.6	49.4	50.1	50.8	51.9	52.9	58.1
60	49.3	51.1	51.9	52.6	53.8	54.8	60.1
62	51.0	52.7	53.7	54.4	55.6	56.6	62.2
64	52.7	54.6	55.5	56.2	57.4	58.5	64.3
66	54.3	56.4	57.2	58.0	59.3	60.4	66.3
68	56.0	58.1	59.0	59.8	61.1	62.3	68.4
70	57.7	59.9	60.8	61.6	63.0	64.1	70.4
72	59.4	61.6	62.5	63.4	64.8	66.0	72.5
74	61.1	63.4	64.3	65.2	66.6	67.9	74.5
76	62.8	65.1	66.1	67.0	68.5	69.7	76.6
78	64.4	66.9	67.9	68.8	70.3	71.6	78.7
80	66.1	68.6	69.6	70.6	72.1	73.5	80.7
82	67.8	70.4	71.4	72.3	74.0	75.4	82.8
84	69.5	72.1	73.2	74.1	75.8	77.2	84.8
86	71.2	73.9	75.0	75.9	77.7	79.1	86.9
88	72.9	75.6	76.7	77.7	79.5	81.0	88.9
90	74.5	77.3	78.5	79.5	81.3	82.8	91.0
	76.2	79.1	80.3	81.3	83.2	84.7	93.0

EQUATION: $D = (B6 + DSI(B7 + E8 * LOG((S + 0.3048) / 1.6764))) / (1 - 0.04365 * B2)$
 WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.118 ; E6 = 0.490 ; E7 = 1.028 ; B8 = 0.112

DATA SOURCE: 2110 TREES FROM ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BLACK SPRUCE / PICEA MARIANA (MILL.) B.S.P.

DSIE CLASS (CM)	STUMP HEIGHT (M)									
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30		
5	4.7	4.9	5.0	5.1	5.2	5.4	5.5	6.0		
10	8.5	8.9	9.1	9.2	9.5	9.8	10.0	11.1		
15	12.2	12.9	13.2	13.4	13.8	14.2	14.5	16.1		
20	16.0	16.9	17.2	17.6	18.1	18.6	19.0	21.2		
24	17.5	18.4	18.9	19.2	19.8	20.4	20.8	23.3		
26	19.0	20.0	20.5	20.9	21.6	22.1	22.6	25.3		
28	20.5	21.6	22.1	22.5	23.3	23.9	24.5	27.3		
30	22.0	23.2	23.7	24.2	25.0	25.7	26.3	29.3		
32	23.5	24.8	25.4	25.9	26.7	27.4	28.1	31.4		
34	25.0	26.4	27.0	27.5	28.4	29.2	29.9	33.4		
36	26.5	28.0	28.6	29.2	30.2	31.0	31.7	35.4		
38	28.0	29.6	30.2	30.8	31.9	32.7	33.5	37.4		
40	29.5	31.2	31.9	32.5	33.6	34.5	35.3	39.5		
42	31.0	32.8	33.5	34.2	35.3	36.3	37.1	41.5		
44	32.5	34.4	35.1	35.8	37.0	38.0	38.9	43.5		
46	34.0	35.9	36.6	37.5	38.7	39.8	40.7	45.6		
48	35.5	37.5	38.4	39.1	40.5	41.6	42.5	47.6		
50	37.0	39.1	40.0	40.8	42.2	43.3	44.3	49.6		
52	38.5	40.7	41.6	42.5	43.9	45.1	46.2	51.6		
54	40.0	42.3	43.3	44.1	45.6	46.9	48.0	53.6		
56	41.5	43.9	44.9	45.8	47.3	48.6	49.8	55.7		
58	43.0	45.5	46.5	47.5	49.1	50.4	51.6	57.7		
60	44.5	47.1	48.2	49.1	50.8	52.2	53.4	59.7		
62	46.0	48.7	49.8	50.8	52.5	53.9	55.2	61.7		
64	47.5	50.3	51.4	52.4	54.2	55.7	57.0	63.8		
66	49.0	51.9	53.0	54.1	55.9	57.5	58.8	65.8		
68	50.5	53.5	54.7	55.8	57.6	59.2	60.6	67.8		
70	52.0	55.0	56.3	57.4	59.4	61.0	62.4	69.9		
72	53.5	56.6	57.9	59.1	61.1	62.8	64.2	71.9		
74	55.0	58.2	59.6	60.7	62.8	64.5	66.1	73.9		
76	56.5	59.8	61.2	62.4	64.5	66.3	67.9	75.9		
78	58.0	61.4	62.8	64.1	66.2	68.1	69.7	78.0		
80	59.5	63.0	64.4	65.7	68.0	69.8	71.5	80.0		
82	61.0	64.6	66.1	67.4	69.7	71.6	73.3	82.0		
84	62.5	66.2	67.7	69.0	71.4	73.4	75.1	84.0		
86	64.0	67.8	69.3	70.7	73.1	75.1	76.9	86.1		
88	65.5	69.4	70.9	72.4	74.8	76.9	78.7	88.1		
90	67.0	71.0	72.6	74.0	76.5	78.7	80.5	90.1		
90	68.5	72.5	74.2	75.7	78.3	80.4	82.3	92.1		

EQUATION: $D = (B6 + DSI(B7 + B8 * LOG((S + 0.3048) / (1 - 0.04365 * B2))) / (1 - 0.04365 * B2))$
 WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.164 ; B6 = 0.937 ; B7 = 1.013 ; B8 = 0.157

DATA SOURCE: 1766 TREES FROM NFLD., N.B., QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

RED SPRUCE / PICEA RUBENS SARG.

DSIB CLASS (CM)	STUMP HEIGHT (M)									
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30		
5	4.1	4.4	4.5	4.6	4.7	4.9	5.0	5.6		
10	7.8	8.3	8.5	8.7	9.1	9.3	9.6	10.8		
15	11.5	12.3	12.6	12.9	13.4	13.8	14.1	16.0		
20	15.2	16.3	16.7	17.0	17.7	18.2	18.7	21.2		
22	16.7	17.8	18.3	18.7	19.4	20.0	20.5	23.3		
24	18.2	19.4	19.9	20.4	21.1	21.8	22.4	25.4		
26	19.7	21.0	21.5	22.0	22.9	23.6	24.2	27.4		
28	21.2	22.6	23.2	23.7	24.6	25.4	26.0	29.5		
30	22.6	24.1	24.8	25.3	26.3	27.1	27.8	31.5		
32	24.1	25.7	26.4	27.0	28.0	28.9	29.7	33.6		
34	25.6	27.3	28.0	28.7	29.8	30.7	31.5	35.7		
36	27.1	28.9	29.7	30.3	31.5	32.5	33.3	37.8		
38	28.6	30.5	31.2	32.0	33.2	34.3	35.2	39.8		
40	30.1	32.1	32.9	33.7	34.9	36.0	37.0	41.9		
42	31.5	33.7	34.5	35.3	36.7	37.8	38.8	44.0		
44	33.0	35.2	36.2	37.0	38.4	39.6	40.6	46.1		
46	34.5	36.8	37.8	38.6	40.1	41.4	42.5	48.1		
48	36.0	38.4	39.4	40.3	41.8	43.2	44.3	50.2		
50	37.5	40.0	41.0	42.0	43.6	44.9	46.1	52.3		
52	38.9	41.6	42.7	43.6	45.3	46.7	47.9	54.4		
54	40.4	43.2	44.3	45.3	47.0	48.5	49.8	56.4		
56	41.9	44.7	45.9	46.9	48.8	50.3	51.6	58.5		
58	43.4	46.3	47.5	48.6	50.5	52.1	53.4	60.6		
60	44.9	47.9	49.2	50.3	52.2	53.8	55.3	62.6		
62	46.4	49.5	50.8	51.9	53.9	55.6	57.1	64.7		
64	47.8	51.1	52.4	53.6	55.7	57.4	58.9	66.8		
66	49.3	52.7	54.0	55.3	57.4	59.2	60.7	68.9		
68	50.8	54.2	55.6	56.9	59.1	61.0	62.6	70.9		
70	52.3	55.8	57.3	58.6	60.8	62.7	64.4	73.0		
72	53.8	57.4	58.9	60.2	62.6	64.5	66.2	75.1		
74	55.2	59.0	60.5	61.9	64.3	66.3	68.1	77.2		
76	56.7	60.6	62.1	63.6	66.0	68.1	69.9	79.3		
78	58.2	62.1	63.8	65.2	67.7	69.9	71.7	81.4		
80	59.7	63.7	65.4	66.9	69.5	71.6	73.5	83.5		
82	61.2	65.3	67.0	68.5	71.2	73.4	75.4	85.5		
84	62.6	66.9	68.6	70.2	72.9	75.2	77.2	87.5		
86	64.1	68.5	70.3	71.9	74.6	77.0	79.0	89.6		
88	65.6	70.1	71.9	73.5	76.4	78.8	80.8	91.7		
90	67.1	71.6	73.5	75.2	78.1	80.5	82.7	93.8		

EQUATION: $D = (E6 + DSI(B7 + B8 * \text{LOG}((S + 0.3048) / 1.6764))) / (1 - 0.04365 * B2)$
 WHERE: C = DEHQB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.169 ; E6 = 0.424 ; E7 = 1.037 ; B8 = 0.177

DATA SOURCE: 146 TREES FROM N.B.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE SPRUCE / PICEA GLAUCA (MCENCH) VCSS

DSIB CLASS (CM)	STUMP HEIGHT (M)							1.30
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
5	5.0	5.3	5.4	5.5	5.7	5.7	5.8	6.4
10	8.0	9.2	9.4	9.7	9.8	10.0	10.2	11.4
15	12.1	13.1	13.4	13.8	14.0	14.2	14.6	16.3
20	15.7	17.0	17.4	18.0	18.3	18.5	19.0	21.3
22	17.1	18.6	19.0	19.7	19.9	20.2	20.7	23.5
24	18.5	20.2	20.6	21.3	21.5	21.7	22.0	25.3
26	20.0	21.7	22.2	23.0	23.2	23.7	24.0	27.3
28	21.4	23.3	23.8	24.7	24.9	25.4	25.7	29.3
30	22.8	24.9	25.4	26.3	26.5	27.1	27.3	31.3
32	24.2	26.4	27.0	28.0	28.2	28.8	29.0	33.3
34	25.6	28.0	28.6	29.6	29.8	30.5	30.7	35.3
36	27.1	29.6	30.2	31.3	31.5	32.0	31.3	37.3
38	28.5	31.1	31.8	33.0	33.2	34.0	34.1	39.3
40	30.0	32.7	33.4	34.6	34.8	35.7	35.8	41.3
42	31.4	34.2	35.0	36.3	36.5	37.4	37.5	43.3
44	32.8	35.8	36.6	38.0	38.2	39.1	39.1	45.3
46	34.2	37.4	38.2	39.6	39.8	40.8	40.8	47.3
48	35.6	38.9	39.7	41.3	41.5	42.5	42.5	49.3
50	37.1	40.5	41.4	42.9	43.1	44.2	44.2	51.3
52	38.5	42.1	43.0	44.5	44.7	46.0	46.0	53.3
54	40.0	43.6	44.6	46.3	46.5	47.7	47.7	55.3
56	41.4	45.2	46.2	47.9	48.1	49.4	49.4	57.3
58	42.8	46.8	47.8	49.6	49.8	51.1	51.1	59.3
60	44.2	48.3	49.4	51.2	51.4	52.8	52.8	61.3
62	45.7	49.9	51.0	52.9	53.1	54.5	54.5	63.3
64	47.1	51.5	52.6	54.6	54.8	56.2	56.2	65.3
66	48.5	53.0	54.2	56.2	56.4	58.0	58.0	67.3
68	50.0	54.6	55.8	57.9	58.1	59.7	59.7	69.3
70	51.4	56.2	57.4	59.6	59.8	61.4	61.4	71.3
72	52.8	57.7	59.0	61.3	61.5	64.0	64.0	73.3
74	54.2	59.3	60.6	62.9	63.1	64.8	64.8	75.3
76	55.7	60.9	62.2	64.5	64.7	66.5	66.5	77.3
78	57.1	62.4	63.8	66.2	66.4	68.2	68.2	79.3
80	58.5	64.0	65.4	67.9	68.1	70.0	70.0	81.3
82	60.0	65.6	67.0	69.5	69.7	71.7	71.7	83.3
84	61.4	67.1	68.6	71.2	71.4	73.4	73.4	85.3
86	62.8	68.7	70.2	72.9	73.1	75.1	75.1	87.3
88	64.2	70.2	71.8	74.5	74.7	76.8	76.8	89.3
90	65.7	71.8	73.4	76.2	76.4	78.5	78.5	91.3

EQUATION: D = (E6+DSI*(B7+E8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)

WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.176 ; E6 = 1.372 ; B7 = 0.997 ; E8 = 0.169

DATA SOURCE: 1292 TREES FROM N.B., QUE., CNT., MAN., SASK., ALTA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

BALSAM FIR / ABIES EALSAMEA (L.) MILL.

DSIB CLASS (CM)	STUMP HEIGHT (M)							1.30
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
5	5.0	5.2	5.2	5.3	5.4	5.5	5.6	6.0
10	9.0	9.4	9.5	9.6	9.9	10.0	10.2	11.1
15	13.0	13.6	13.8	14.0	14.3	14.6	14.8	16.1
20	17.1	17.8	18.1	18.3	18.8	19.1	19.5	21.2
24	20.3	21.1	21.5	21.8	22.5	22.8	23.2	25.2
26	21.9	22.8	23.2	23.5	24.1	24.6	25.0	27.2
28	23.5	24.5	24.9	25.3	25.9	26.4	26.9	29.2
30	25.1	26.2	26.6	27.0	27.7	28.2	28.7	31.2
32	26.7	27.9	28.3	28.7	29.4	30.0	30.6	33.3
34	28.3	29.5	30.0	30.5	31.2	31.8	32.4	35.5
36	30.0	31.2	31.7	32.2	33.0	33.7	34.3	37.7
38	31.6	32.9	33.4	33.9	34.8	35.5	36.1	39.5
40	33.2	34.6	35.1	35.7	36.5	37.3	38.0	41.5
42	34.8	36.3	36.9	37.4	38.3	39.1	39.8	43.4
44	36.4	37.9	38.6	39.1	40.1	40.9	41.6	45.4
46	38.0	39.6	40.3	40.9	41.9	42.7	43.5	47.4
48	39.6	41.3	42.0	42.6	43.7	44.6	45.3	49.4
50	41.2	43.0	43.7	44.3	45.4	46.4	47.2	51.4
52	42.8	44.7	45.4	46.1	47.2	48.2	49.0	53.5
54	44.5	46.3	47.1	47.8	49.0	50.0	50.9	55.5
56	46.1	48.0	48.8	49.5	50.8	51.8	52.7	57.5
58	47.7	49.7	50.5	51.3	52.6	53.6	54.6	59.5
60	49.3	51.4	52.2	53.0	54.3	55.5	56.4	61.5
62	50.9	53.1	53.9	54.7	56.1	57.3	58.3	63.5
64	52.5	54.7	55.7	56.5	57.9	59.1	60.1	65.6
66	54.1	56.4	57.4	58.2	59.7	60.9	62.0	67.6
68	55.7	58.1	59.1	59.9	61.5	62.7	63.8	69.6
70	57.3	59.8	60.8	61.7	63.2	64.5	65.7	71.6
72	59.0	61.5	62.5	63.4	65.0	66.4	67.5	73.6
74	60.6	63.1	64.2	65.1	66.8	68.2	69.4	75.7
76	62.2	64.8	65.9	66.9	68.6	70.0	71.2	77.7
78	63.8	66.5	67.6	68.6	70.3	71.8	73.1	79.7
80	65.4	68.2	69.3	70.4	72.1	73.6	74.9	81.7
82	67.0	69.9	71.0	72.1	73.9	75.4	76.8	83.7
84	68.6	71.5	72.7	73.8	75.7	77.3	78.6	85.8
86	70.2	73.2	74.5	75.6	77.5	79.1	80.5	87.8
88	71.8	74.9	76.2	77.3	79.2	80.9	82.3	89.8
90	73.4	76.6	77.9	79.0	81.0	82.7	84.2	91.8

EQUATION: $D = (B6 + DSI(B7 + B8 * LOG((S + 0.3048) / (1.6764))) / (1 - 0.04365 * B2))$
 WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.152 ; B6 = 0.960 ; B7 = 1.008 ; B8 = 0.122

DATA SOURCE: 2316 TREES FROM NFDL, N.B., GUE., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

SOFTWOODS

DSIB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.7	4.9	5.0	5.1	5.2	5.3	5.4
10	8.7	9.1	9.3	9.4	9.7	9.9	10.1
15	12.7	13.3	13.5	13.7	14.1	14.5	14.7
20	16.6	17.5	17.8	18.1	18.6	19.0	19.4
22	18.2	19.1	19.5	19.8	20.4	20.9	21.3
24	19.8	20.8	21.2	21.6	22.2	22.7	23.2
26	21.4	22.5	22.9	23.3	24.0	24.5	25.0
28	23.0	24.2	24.6	25.0	25.8	26.4	26.9
30	24.6	25.8	26.3	26.8	27.5	28.2	28.8
32	26.2	27.5	28.0	28.5	29.3	30.0	30.6
34	27.8	29.2	29.7	30.2	31.1	31.9	32.5
36	29.4	30.8	31.4	32.0	32.9	33.7	34.4
38	31.0	32.5	33.2	33.7	34.7	35.5	36.3
40	32.6	34.2	34.9	35.5	36.5	37.4	38.1
42	34.2	35.9	36.6	37.2	38.3	39.2	40.0
44	35.8	37.5	38.3	38.9	40.1	41.0	41.9
46	37.4	39.2	40.0	40.7	41.9	42.9	43.7
48	38.9	40.9	41.7	42.4	43.6	44.7	45.6
50	40.5	42.6	43.4	44.1	45.4	46.5	47.5
52	42.1	44.2	45.1	45.9	47.2	48.4	49.3
54	43.7	45.9	46.8	47.6	49.0	50.2	51.2
56	45.3	47.6	48.5	49.4	50.8	52.0	53.1
58	46.9	49.3	50.2	51.1	52.6	53.9	55.0
60	48.5	50.9	51.8	52.7	54.4	55.7	56.8
62	50.1	52.6	53.6	54.6	56.2	57.5	58.7
64	51.7	54.3	55.3	56.3	57.9	59.4	60.7
66	53.3	56.0	57.1	58.0	59.7	61.2	62.4
68	54.9	57.6	58.8	59.8	61.5	63.0	64.3
70	56.5	59.3	60.5	61.5	63.3	64.9	66.2
72	58.1	61.0	62.2	63.2	65.1	66.7	68.0
74	59.6	62.6	63.9	65.0	66.9	68.5	69.9
76	61.2	64.3	65.6	66.7	68.7	70.3	71.8
78	62.8	66.0	67.3	68.5	70.5	72.2	73.7
80	64.4	67.7	69.0	70.2	72.3	74.0	75.5
82	66.0	69.3	70.7	71.9	74.1	75.8	77.4
84	67.6	71.0	72.4	73.7	75.8	77.7	79.3
86	69.2	72.7	74.1	75.4	77.6	79.5	81.1
88	70.8	74.4	75.8	77.1	79.4	81.3	83.0
90	72.4	76.0	77.5	78.9	81.2	83.2	84.9

EQUATION: D = (E6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)
 WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;
 B2 = 0.155 ; E6 = 0.716 ; B7 = 1.033 ; B8 = 0.142

DATA SOURCE: 13252 TREES FROM CENTRAL AND EASTERN CANADA

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

POPLAR / PCPULUS SPP.

DSIB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	5.1	5.2	5.3	5.4	5.5	5.5	5.6
10	9.3	9.6	9.7	9.9	10.1	10.1	10.4
15	13.5	14.0	14.2	14.4	14.7	14.7	15.2
20	17.7	18.4	18.6	18.9	19.3	19.3	19.8
24	19.4	20.1	20.4	20.7	21.1	21.1	21.5
28	21.1	21.9	22.2	22.5	23.0	23.0	23.7
32	22.8	23.6	24.0	24.3	24.8	24.8	25.6
36	24.4	25.4	25.7	26.1	26.6	26.6	27.7
40	26.1	27.1	27.5	27.9	28.5	28.5	29.8
44	27.8	28.9	29.3	29.7	30.3	30.3	31.8
48	29.5	30.6	31.1	31.5	32.2	32.2	33.9
52	31.2	32.4	32.8	33.3	34.0	34.0	36.0
56	32.9	34.1	34.6	35.1	35.9	35.9	38.0
60	34.6	35.9	36.4	36.9	37.7	37.7	40.1
64	36.2	37.6	38.2	38.7	39.5	39.5	42.2
68	37.9	39.4	39.9	40.5	41.4	41.4	44.3
72	39.6	41.1	41.7	42.3	43.2	43.2	46.4
76	41.3	42.9	43.5	44.1	45.1	45.1	48.4
80	43.0	44.6	45.3	45.9	46.9	46.9	50.4
84	44.7	46.4	47.0	47.7	48.7	48.7	52.5
88	46.3	48.1	48.8	49.5	50.6	50.6	54.6
90	48.0	49.8	50.6	51.3	52.4	52.4	56.7
	49.7	51.6	52.4	53.1	54.3	54.3	58.8
	51.4	53.3	54.2	54.9	56.1	56.1	60.9
	53.1	55.1	55.9	56.7	58.0	58.0	62.9
	54.8	56.8	57.7	58.5	59.8	59.8	64.9
	56.5	58.6	59.5	60.3	61.6	61.6	67.0
	58.1	60.3	61.3	62.1	63.5	63.5	69.0
	59.8	62.1	63.0	63.9	65.3	65.3	71.1
	61.5	63.8	64.8	65.7	67.2	67.2	73.2
	63.2	65.6	66.6	67.5	69.0	69.0	75.2
	64.9	67.3	68.4	69.3	70.8	70.8	77.3
	66.6	69.1	70.1	71.1	72.7	72.7	79.3
	68.2	70.8	71.9	72.9	74.5	74.5	81.4
	69.9	72.6	73.7	74.7	76.4	76.4	83.5
	71.6	74.3	75.5	76.5	78.2	78.2	85.5
	73.3	76.1	77.2	78.3	80.1	80.1	87.6
	75.0	77.8	79.0	80.1	81.9	81.9	89.7
	76.7	79.6	80.8	81.9	83.7	83.7	91.7
							93.8

EQUATION: $D = (B6 + DS1(B7 + E8 * \log((S + 0.3048) / (1 - 0.6764))) / (1 - 0.04365 * B2))$

WHERE: D = DBHCB ; DS1 = STUMP DIAMETER INSIDE BARK ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.127 ; B6 = 0.853 ; E7 = 1.032 ; B8 = 0.114

DATA SOURCE: 1082 TREES FROM QUE., ONT., MAN., SASK.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

WHITE BIRCH / BETULA PAPIRIFERA MARSH.

DSIE CLASS (CM)	STUMP HEIGHT (M)							1.30
	0.00	0.10	0.15	0.20	0.30	0.40	0.50	
5	4.0	4.3	4.4	4.5	4.6	4.7	4.9	5.5
10	7.8	8.3	8.5	8.7	9.0	9.3	9.5	10.7
15	11.6	12.3	12.6	12.9	13.4	13.8	14.1	15.9
20	15.3	16.3	16.7	17.1	17.7	18.3	18.7	21.2
24	16.8	17.9	18.4	18.8	19.5	20.1	20.6	23.3
26	18.3	19.5	20.0	20.5	21.2	21.9	22.4	25.3
28	19.9	21.1	21.7	22.2	23.0	23.7	24.3	27.4
30	21.4	22.8	23.3	23.8	24.7	25.5	26.1	29.5
32	22.9	24.4	25.0	25.5	26.5	27.3	28.0	31.6
34	24.4	26.0	26.6	27.2	28.2	29.1	29.8	33.7
36	25.9	27.6	28.3	28.9	30.0	30.9	31.7	35.8
38	27.4	29.2	29.9	30.6	31.7	32.7	33.5	37.9
40	28.9	30.8	31.6	32.3	33.5	34.5	35.4	40.0
42	30.4	32.4	33.2	33.9	35.2	36.3	37.2	42.1
44	31.9	34.0	34.9	35.6	37.0	38.1	39.1	44.2
46	33.4	35.6	36.5	37.3	38.7	39.9	40.9	46.3
48	34.9	37.2	38.2	39.0	40.5	41.7	42.8	48.4
50	36.4	38.8	39.8	40.7	42.2	43.5	44.6	50.4
52	38.0	40.4	41.5	42.4	44.0	45.3	46.5	52.5
54	41.0	42.7	43.8	44.7	45.7	47.1	48.3	54.6
56	42.5	45.3	46.4	47.4	47.5	48.9	50.2	56.7
58	44.0	46.9	48.1	49.1	49.2	50.7	52.0	58.8
60	45.5	48.5	49.7	50.8	51.0	52.5	53.9	60.9
62	47.0	49.7	51.4	52.5	52.7	54.3	55.7	63.0
64	48.5	51.7	53.0	54.2	54.5	56.1	57.6	65.1
66	50.0	53.3	54.6	55.9	56.2	57.9	59.4	67.2
68	51.5	54.9	56.3	57.5	57.9	59.7	61.3	69.3
70	53.0	56.5	57.9	59.2	61.4	63.3	65.0	71.4
72	54.5	58.1	59.6	60.9	63.2	65.1	66.8	73.5
74	56.1	59.7	61.2	62.6	64.9	66.9	68.6	75.6
76	57.6	61.3	62.9	64.3	66.7	68.7	70.5	77.7
78	59.1	62.9	64.5	66.0	68.4	70.5	72.3	81.8
80	60.6	64.6	66.2	67.7	70.2	72.3	74.2	83.9
82	62.1	66.2	67.8	69.3	71.9	74.1	76.0	86.0
84	63.6	67.8	69.5	71.0	73.7	75.9	77.9	88.1
86	65.1	69.4	71.1	72.7	75.4	77.7	79.7	90.2
88	66.6	71.0	72.8	74.4	77.2	79.5	81.6	92.3
90	68.1	72.6	74.4	76.1	78.9	81.3	83.4	94.3

EQUATION: D = (E6+DSI(B7+B8*LOG((S+0.3048)/1.6764)))/(1-0.04365*B2)

WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ; S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.176 ; E6 = 0.241 ; B7 = 1.045 ; B8 = 0.174

DATA SOURCE: 298 TREES FROM QUE., ONT., ALIA.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

YELLOW BIRCH / BETULA ALLEGHANIENSIS BRITT.

DSIB CLASS (CM)	0.00	0.10	0.15	0.20	0.30	0.40	0.50	1.30
5	4.2	4.5	4.6	4.7	4.9	5.0	5.1	5.8
10	7.9	8.4	8.6	8.8	9.2	9.4	9.7	11.0
15	11.5	12.3	12.7	12.9	13.5	13.8	14.3	16.2
20	15.2	16.2	16.7	17.1	17.7	18.3	18.8	21.4
22	16.7	17.8	18.3	18.7	19.5	20.1	20.6	23.5
24	18.1	19.4	19.9	20.4	21.2	21.9	22.5	25.5
26	19.6	20.9	21.5	22.0	22.9	23.6	24.3	27.6
28	21.0	22.5	23.1	23.7	24.6	25.4	26.1	29.7
30	22.5	24.1	24.7	25.3	26.3	27.2	27.9	31.8
32	24.0	25.6	26.3	27.0	28.0	29.0	29.7	33.9
34	25.4	27.2	28.0	28.6	29.8	30.7	31.6	35.9
36	26.9	28.8	29.6	30.3	31.5	32.5	33.4	38.0
38	28.3	30.3	31.2	31.9	33.2	34.3	35.2	40.1
40	29.8	31.9	32.8	33.6	34.9	36.0	37.0	42.2
42	31.3	33.5	34.4	35.2	36.6	37.8	38.9	44.3
44	32.7	35.0	36.0	36.9	38.3	39.6	40.7	46.3
46	34.2	36.6	37.6	38.5	40.1	41.4	42.5	48.4
48	35.6	38.2	39.2	40.2	41.8	43.1	44.3	50.5
50	37.1	39.7	40.8	41.8	43.5	44.9	46.2	52.6
52	38.6	41.3	42.4	43.5	45.2	46.7	48.0	54.7
54	40.0	42.9	44.1	45.1	46.9	48.5	49.8	56.7
56	41.5	44.4	45.7	46.8	48.6	50.2	51.6	58.8
58	42.9	46.0	47.3	48.4	50.4	52.0	53.4	60.9
60	44.4	47.6	48.9	50.0	52.1	53.8	55.3	63.0
62	45.9	49.1	50.5	51.7	53.8	55.6	57.1	65.1
64	47.3	50.7	52.1	53.3	55.5	57.3	58.9	67.2
66	48.8	52.3	53.7	55.0	57.2	59.1	60.7	69.2
68	50.2	53.8	55.3	56.6	58.9	60.9	62.6	71.3
70	51.7	55.4	56.9	58.3	60.7	62.7	64.4	73.4
72	53.2	57.0	58.5	59.9	62.4	64.4	66.2	75.5
74	54.6	58.5	60.2	61.6	64.1	66.2	68.0	77.6
76	56.1	60.1	61.8	63.2	65.8	68.0	69.9	79.6
78	57.6	61.7	63.4	64.9	67.5	69.7	71.7	81.7
80	59.0	63.2	65.0	66.5	69.2	71.5	73.5	83.8
82	60.5	64.8	66.6	68.2	71.0	73.3	75.3	85.9
84	61.9	66.4	68.2	69.8	72.7	75.1	77.1	88.0
86	63.4	67.9	69.8	71.5	74.4	76.8	79.0	90.0
88	64.9	69.5	71.4	73.1	76.1	78.6	80.8	92.1
90	66.3	71.1	73.0	74.8	77.8	80.4	82.6	94.2

EQUATION: $D = (E6 + DSI(B7 + B8 * LOG((S + 0.3048) / 1.6764))) / (1 - C.04365 * B2)$

WHERE: D = DBHCB ; DSI = STUMP DIAMETER INSIDE BARK ;

S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.181 ; E6 = 0.577 ; B7 = 1.04C ; B8 = 0.18E

DATA SOURCE: 302 TREES FROM QUE., CNT.

DIAMETER BREAST HEIGHT OUTSIDE BARK (CM)

FARDWCCDS

DSIB CLASS (CM)	STUMP HEIGHT (M)						
	0.00	0.10	0.15	0.20	0.30	0.40	0.50
5	4.7	4.9	5.0	5.1	5.2	5.3	5.4
10	8.8	9.2	9.3	9.5	9.7	9.9	10.1
15	12.8	13.4	13.6	13.9	14.2	14.5	14.8
20	16.9	17.6	18.0	18.2	18.7	19.2	19.5
24	18.5	19.3	19.7	20.0	20.5	21.0	21.4
26	20.1	21.0	21.4	21.8	22.3	22.9	23.5
28	21.7	22.7	23.1	23.5	24.2	24.7	25.6
30	23.3	24.4	24.9	25.3	26.0	26.5	27.7
32	24.5	26.1	26.6	27.0	27.8	28.4	29.9
34	26.5	27.8	28.3	28.8	29.6	30.2	31.8
36	28.2	29.5	30.0	30.5	31.4	32.1	33.9
38	29.4	31.2	31.8	32.3	33.2	33.9	35.0
40	31.0	32.9	33.5	34.0	35.0	35.8	38.0
42	32.6	34.5	35.2	35.8	36.8	37.6	40.1
44	34.6	36.5	37.2	37.8	38.6	39.5	42.2
46	36.2	38.0	38.7	39.3	40.4	41.3	44.2
48	37.5	39.6	40.1	41.0	42.2	43.2	46.3
50	41.1	43.0	43.8	44.8	45.8	46.9	48.4
52	42.7	44.7	45.6	46.3	47.6	48.7	50.5
54	44.3	46.4	47.3	48.1	49.4	49.7	52.2
56	45.9	48.1	49.0	49.8	51.2	51.5	54.6
58	47.5	49.8	50.7	51.6	53.0	53.4	56.7
60	49.2	51.5	52.5	53.3	54.8	55.2	59.7
62	50.8	53.2	54.2	55.1	56.6	56.1	60.8
64	52.4	54.9	55.9	56.8	58.4	57.9	62.9
66	54.0	56.6	57.6	58.6	60.2	61.0	65.0
68	55.6	58.3	59.4	60.3	62.0	62.8	67.0
70	57.2	60.0	61.1	62.1	63.8	64.7	69.1
72	58.8	61.7	62.8	63.9	65.6	65.5	71.2
74	60.5	63.4	64.5	65.6	67.5	68.5	73.3
76	62.1	65.0	66.3	67.4	69.3	70.4	75.5
78	63.7	66.7	68.0	69.1	71.1	72.2	77.4
80	65.3	68.4	69.7	70.9	72.9	74.1	79.5
82	66.9	70.1	71.4	72.6	74.7	76.0	81.6
84	68.5	71.8	73.2	74.4	76.5	77.9	83.6
86	70.1	73.5	74.9	76.1	78.3	79.8	85.7
88	71.8	75.2	76.6	77.9	80.1	81.7	87.8
90	73.4	76.9	78.3	79.6	81.9	83.8	89.8
							91.9
							94.0

EQUATION: D = (E6+DSI (B7+E8*LCG((S+0.3048)/1.6764)))/(1-0.04365*B2)
 #WHERE: D = DBHOB ; DSI = STUMP DIAMETER INSIDE BARK ;
 S = STUMP HEIGHT ; LCG = NATURAL LOGARITHM ;

B2 = 0.145 ; E6 = 0.695 ; E7 = 1.036 ; B8 = 0.137

DATA SOURCE: 1682 TREES FROM GUE., CNT., MAN., SASK., ALTA.

APPENDIX VIII. Useful Conversion Factors¹

Metric (SI and derived) units and their Canadian yard/pound equivalents

SI Units		Yard/Pound Equivalents
Length		
1 cm (centimetre)	=	0.393 701 inch
1 km (kilometre)	=	0.621 371 mile
1 m (metre)	=	0.049 709 7 chain (of 22 yd)
1 m (metre)	=	3.280 84 feet
1 m (metre)	=	1.093 61 yards
Area		
1 cm ² (square centimetre)	=	0.155 000 square inch
1 ha (hectare)	=	2.471 05 acres
1 km ² (square kilometre)	=	0.386 102 square mile
m ² (square metre)	=	0.247 105 mil-acre
m ² (square metre)	=	10.7639 square feet
m ² (square metre)	=	1.195 99 square yards
Volume or Capacity		
1 L (litre)	=	0.219 969 gallon
1 m ³ (cubic metre)	=	35.3147 cubic feet
1 m ³ (cubic metre)	=	1.307 95 cubic yards
1 m ³ (cubic metre)	=	0.353 147 cunit (of 100 ft ³ of solid wood)
1 m ³ (stacked), (stacked cubic metre)	=	0.275 896 cord (of 128 stacked ft ³)
Mass or Weight		
1 g (gram)	=	0.035 274 0 ounce (avoirdupois)
1 kg (kilogram)	=	2.204 62 pounds (avoirdupois)
1 t (tonne)	=	1.102 31 tons (of 2,000 lb)
Ratios		
1 kg/m ³ (kilogram per cubic metre)	=	0.062 428 0 pound per cubic foot
1 km/L (kilometre per litre)	=	2.824 81 miles per gallon
1 m ² /ha (square metre per hectare)	=	4.356 00 square feet per acre
1 m ³ /ha (cubic metre per hectare)	=	14.2913 cubic feet per acre
1 m ³ (stacked)/ha, (stacked cubic metre per hectare)	=	0.111 651 cord per acre
1 t/ha (tonne per hectare)	=	0.446 090 ton (of 2,000 lb) per acre

¹Bowen, M.G. 1974. Selected metric (SI) units and conversion factors for Canadian forestry. For. Manage. Inst., Can. For. Serv., Dep. Environ. Ottawa, Ont.



