

Book Review

Tree and Forest Measurement

P.W. West

Springer-Verlag, Berlin, 2004. 167 pages including references and index.
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It has taken over 35 years for a book aimed specifically at the undergraduate forestry student or layperson to replace L.T. Carron's (1968) *An Outline of Forest Mensuration with Special Reference to Australia*. West has deliberately aimed to make this book accessible by keeping the language simple, the cost moderate and the number of pages small — at only 145 pages of text it is the smallest and easiest to read forest measurement textbook available, to my knowledge, in the world. The contents of this book follow the outline of a 'standard' undergraduate course in forest measurement: why measure the forest, and what do we mean by measurement (including accuracy, bias, precision and value of measurements); measuring single trees (stem diameter, tree height, stem wood volume and taper functions and tree biomass); measuring stands of trees (including age, basal area, stocking, mean diameter, dominant height, site productivity capacity, stand volume and biomass); sampling theory (including the measurement of populations and common statistics, sampling techniques and efficiency, stratified random sampling and model-based sampling); conducting an inventory (objectives, stratification, conducting the inventory, establishing and measurement plots or points); and finally a plane survey to determine forest area from ground-based measurements.

To meet his self-imposed limits of accessibility, West has provided very brief introductions to several topics (e.g. development or use of mathematical growth models), but then directs the reader to a number of relatively recent articles that should be available at most university libraries. To attempt to keep the cost of typesetting down, West has excluded photographs and minimised the number of figures (only 17) and their complexity to simple line drawings, so the text looks rather dense upon first inspection. However, West has adopted a 'chatty' approach, so this density does not overwhelm the reader. You can almost imagine hearing him give this material in lecture format to undergraduate students. The chatty approach also allows West to introduce useful snippets of information, practice or history throughout the text. For example, during Chapter 6 (volume and taper functions), West provides an aside into the use of radians versus degrees for measuring angles

and explains the common problem of getting an Excel spreadsheet to use the appropriate unit. Similarly, there is one tantalising mention of dendrochronology in the chapter on measuring leaf biomass. Chapter 6 also includes an 'average' stem volume function, which appears to just use one measurement of dbh to estimate the stem volume (under bark) of any tree species from anywhere in the world to 'generally' within $\pm 20\%$!

The textbook provides a number of worked examples, with much of the data drawn from West's own 30-year history of research and teaching. Seven of the tables presented include data or results from West's student exercises or research, which allow readers to test their understanding with real data. The remaining two tables neatly summarise some valuable data on a range of stem volume equations and their parameter estimates and taper function parameter estimates.

Professionals who want to go on with forest measurement and inventory will need to address longer, more technical and more expensive textbooks. They will also need access to more specific information about standards, as West does not go into detail about the various standards (for example, he explains that the height of a stand is variously categorised as the average height of a variable number of the tallest or largest dbh trees, but does not go into detail about state or regional definitions of how many or which type are selected to determine this average).

In conclusion, West's offering is good value for money and interesting for undergraduate forestry students, non-professionals who have a need for understanding the measurement of forests, and professionals who have been away from the quantification side for many years and want a reminder. It is relatively easy to read, has a comprehensive glossary, and will, I hope, encourage readers into further study of this vital area of sustainable forest management.

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