

BOOK REVIEW

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Fundamentals of Tree-Ring Research [Speer, J. H.: University of Arizona Press, 368 pp., 2010; ISBN 978-0-8165-2684-0]

Fundamentals of Tree-Ring Research by James H. Speer was published in 2010 by the University of Arizona Press (ISBN 978-0-8165-2684-0) and has generated substantial informal discussion in the dendrochronology community, but has never been formally reviewed in *Tree-Ring Research*. Dr. Speer is a Professor in the Department of Geography and Geology at Indiana State University (USA). He has taught and organized the North American Dendroecological Fieldweek since 1997, which has provided him with extensive experience in introducing the basic methods and principles of dendrochronology to beginners and providing advanced training for researchers wishing to increase their skill set within a specific subfield of dendrochronology. These are the same two audiences at which Speer aims his textbook.

The text is arranged with the first few chapters covering topics relevant to all fields of dendrochronology: basic principles, history, growth and structure of wood, field and laboratory methods, and commonly used dendrochronological software and statistical methods. The second half of the book covers several of the subdisciplines of dendrochronology: dendroarchaeology, dendroclimatology, dendroecology, dendrogeomorphology, and dendrochemistry. These sections are unlikely to be read page-by-page, but instead readers will focus on the subdisciplines of greatest interest to them. The book closes with a chapter on frontiers in dendrochronology where the author outlines some emerging fields in dendrochronology such as applications of wood anatomy in dendrochronology and using tropical tree species that may not put on regular annual rings as proxy sources in dendrochronology research.

Fundamentals of Tree-Ring Research is a helpful resource for students new to dendrochronology or for scientists from other disciplines who are interested in learning the basics of dendrochronology. Throughout the book, Speer provides clear, concise real-world examples, from many disciplines, which demonstrate dendrochronological principles and techniques. As with any textbook, some items, e.g. the keystroke tutorials for ARSTAN and COFECHA, will likely have a relatively limited lifespan and become outdated as new software is developed and updates for existing software are released. However, the general principles that make-up the majority of the textbook will have staying power and be of value for generations of future tree-ring researchers.

Although we were pleased to see the chapter on “Growth and Structure of Wood” because it is important to understand the biology of tree-ring formation, unfortunately, this chapter was the weakest part of the book. Organizationally, the publisher arranged this chapter with all the text in the first seven pages and then the figures follow for 28 separate image plates. To add to this unfortunate structure, there are a number of areas where the content is potentially confusing. For example, on page 55 the caption for Figure 4.7 reads, “Resin ducts in a gymnosperm... The resin duct is a large hollow vessel that is surrounded by guard cells.” This caption is potentially misleading for readers because vessels only occur in hardwoods and not in conifers. We recommend that if readers are interested in expanding their knowledge of basic wood anatomy, they consult additional sources for better explorations of this topic.

Overall, *Fundamentals of Tree-Ring Research* fills an important niche in the dendrochronology literature by providing an introductory textbook

that clearly outlines the principles and methods used in dendrochronology and introduces advanced topics from the different subdisciplines. For more experienced researchers, this textbook

can serve as a valuable starting point for exploring advanced techniques because Speer prolifically cites technical literature that can be examined for more detailed information.