Tree Rings and Natural Hazards: a State-of-the-Art. Volume 41, Advances in Global Change Research

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TREE RINGS AND NATURAL HAZARDS: A STATE-OF-THE-ART. Volume 41, Advances in Global Change Research. By Markus Stoffel, Michelle Bollschweiler, David R. Butler, and Brian H. Luckman (eds.). Dordrecht and New York: Springer, 2010. 505 + xv pp, 177 illus. $209.00 (hardcover). ISBN 978-90-481-8735-5.

TREE RINGS AND NATURAL HAZARDS provides a needed and useful survey of a rapidly expanding area of research: using dendrochronology to study geomorphic hazards, including snow avalanches, landslides, rockfall, debris flows, flooding, earthquakes, and volcanic activity. The book is much less successful,

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however, in covering two non-geomorphic hazards: wildfires and meteorological hazards. And like most books with contributions from dozens of authors, it suffers from some repetition and uneven quality, as well as inconsistent focus on the overall objective of the book: informing the assessment and mitigation of these natural hazards. Potential buyers and readers also need to be aware that the book is an unusual hybrid of a typical edited volume (i.e., new papers) and a reader (reprints of papers selected from the literature), and it is not made clear which contributions are new, and which are ''recycled.''

The organization of the book is straightforward. The introductory chapter, by the editors, gives a succinct overview of the tree-ring characteristics from which hazards events and their timing can be inferred, as well as the methods to sample and assess these characteristics. This chapter describes those tree processes that are germane to geomorphic hazards, but omits those specific to wildfire and most meteorological hazards. The remainder of the book is comprised of nine parts, each dedicated to a specific hazard: snow avalanches, landslides, rockfall, debris flows, flooding, meteorological hazards, wildfires, earthquakes, and volcanic activity. Each part begins with a 6- to 10-page overview essay by practitioners in that specialty, followed by two ''case studies''—longer research reports, journal papers—and one to three much shorter (2–5 page) research synopses. Having, thus, a total of three to five different research ''cases'' for each hazard, in addition to the overview essay, provides—in most cases—a diverse and representative sampling of the methodological approaches and applications specific to each hazard.

The editors do note in the introduction that only some of the contributions are original to this volume and ''most'' are ''reformatted or rewritten'' from previously published papers. (The blurb on the back cover adds the detail that ''Several of the chapters are 'classic studies.'") But the editors' handling of this mix of old and new work has two serious flaws. First, they left it to the reader to try to distinguish the new contributions from those that were ''reformatted or rewritten''; in only one case did I see the original publication venue clearly indicated (in the acknowledgements for that contribution). This lack of transparency is disturbing, and makes it difficult to assess the ''added value'' of a $200 book relative to the primary literature one may have read already. Second, the book purports to represent the ''state of the art'' (per the title) but republishes several papers from the 1980s and 1990s as is, with no revision or commentary to bring them to the present day.

The chapters on non-geomorphic hazards are the weakest in the book, and one wonders if the book was originally restricted to geomorphic hazards, as the scope of the introduction suggests, with the others tacked on late in the process. The chapter on ''Meteorological hazards'' begins with a peculiar overview essay by the series editor (''Weather and Climate Extremes: Where Can Dendrochronology Help?'') that eschews the natural hazards context of the other overview essays, spends barely a half-page describing dendroclimate methods, and seems overly oriented towards climate modeling. In fact, it appears to be largely recycled from a 2002 paper which asked the same ''where can dendrochronology help?'' question, but with respect to climate modeling. This overview is followed by two case studies on the reconstruction of hurricanes from tree-ring isotopes (both are good, but why two?), and a very short research note on tree-ring responses to a single historical tornado event. This is a remarkably poor representation of the rich dendroclimatological literature, even if that literature is restricted to shorter time-scale ''hazards'' as opposed to longer-term variability.

The chapter on Wildfires begins with a very short overview essay whose coverage, like the one on Meteorological hazards, is incommensurate with the longer overview essays for the geomorphic hazards. This is followed by an odd editorial choice: the longest paper in the entire volume, ''Mesoscale Disturbance and Ecological Response to Decadal Climate Variability in the American Southwest'' by T. W. Swetnam and J. L. Betancourt. This is an excellent and oft-cited synthesis paper first published in 1998, but it is not clearly responsive to the objectives of the book—a trait shared by the other ''case study'' in this chapter. The space might have been better used for papers that are much more explicit in linking tree-ring research on fires to hazard assessment and mitigation.

The other seven chapters, covering the geomorphic hazards, do a much better job of surveying the methods and literature specific to that earth process and imparting a natural hazards perspective. For the most part the overview essays in these chapters are strong efforts at synthesis, and the quality, utility, and breadth of the other contributions for each hazard are generally very good. There are still some annoyances that could have been resolved by the editors; for example, a few of the overview essays do not cite or place into context the contributions (whether old or new) in their respective chapters. And the chapter on Earthquakes has, effectively, two overview essays: a brief one (''Tree Rings and Earthquakes'') contributed for this volume, and a much longer one: a reprint of a 1997 review paper on the ''Application of Tree-Ring Analysis to Paleoseismology.'' Combining these into a single essay would have been more effective.

Ultimately, the defects of this book do not eclipse its central strength: that it presents a huge amount of valuable information on dendrochronological analysis of geomorphic hazards in one place. Any tree-ring scientist with at least a passing interest in those hazards would profit from reading this book, as would other geoscientists and specialists in natural hazards. Whether it is worth buying for one's personal bookshelf is a more difficult judgment and one that needs to be informed by very close scrutiny of the contents.

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