

Book Reviews

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Tropical forest ecology comes of age

Carson, Walter P., and Stefan A. Schnitzer, editors. 2008. **Tropical forest community ecology**. Wiley-Blackwell, Malden, Massachusetts. xvii + 517 p. \$79.95 (cloth), ISBN 978-1-4051-8952-1; \$20.00 (paper), ISBN 978-1-4051-1897-2.

Key words: biodiversity; community ecology; conservation; succession; tropical rain forest.

The “tropics”—that area of the globe between the Tropic of Cancer and the Tropic of Capricorn—hosts the majority of the planet’s biological diversity and the bulk of the world’s nearly seven billion inhabitants. The former, along with its always startling natural history, its bewildering array of interspecific interactions, and its evolutionary novelties, attracts ecologists like flames attract moths. The latter, historically disdained by ecologists studying obscure organisms in pristine sites, will determine the fate of the former. And like most texts and edited volumes about ecology and ecological processes, *Tropical forest community ecology* paints ecological theory and observations strongly but integrates humanity into the picture only weakly, and only at the final edges.

Five of the book’s six sections, and 24 of its 28 chapters provide a reasonably up-to-date (mostly through 2005) synopsis of the current understanding of determinants and drivers of plant species diversity in tropical (mostly wet) forests; secondary succession well beyond the gap-dynamic paradigm of the 1980s; herbivory; and tri-trophic interactions. The reader is treated to a predictable discussion of the relative merits of neutral theory, niche partitioning, and competition-colonization trade-offs that would have benefited from more attention to post-2005 literature on these topics (Jérôme Chave seems to be the only author in the volume to have taken advantage of the opportunity provided by the editors to update his chapter prior to final publication). There is a wealth of natural history (Elizabeth Arnold’s overview of tropical endophytic fungi is a standout here), and Lee Dyer emphasizes its importance for tropical ecologists hoping to ever make sense of the wide range of interactions and processes they observe.

But the chapters that really shine are those that not only bring ecological theory to bear on the astonishing natural history but also explicitly make comparisons between temperate and tropical systems. Paul Fine and his colleagues use a modern geographic age and area hypothesis to link patterns of plant species diversity between tropical, temperate, and boreal biomes. Walter Carson and his colleagues contrast temperate and tropical forests in their review of data that address the Janzen-Connell hypothesis that density- and distance-dependent natural enemies regulate plant populations and enhance local species richness. Chris Peterson and Walter Carson compare temperate- and tropical-based models of old-field succession. Synthetic work like this suggests that there really may be general theories for ecology, not taxon-, habitat-, or biome-specific theories leading to an endless stream of unrelated case studies.

The chapter authors and editors, however, missed an opportunity to better integrate ecology and conservation in

tropical forests. In his Foreword, S. Joseph Wright accurately captures the excitement of tropical ecology, but goes on to note that “the final section of this volume [the four chapters on forest conservation] would shock a 1970s graduate student” (i.e., when he himself was a graduate student), as he asserts that what we now think of as the “tropical deforestation crisis” was only first publicized in the 1970s and that “the severity of deforestation in 2007 and the many exacerbating problems would [have been] entirely unexpected.” Methinks he doth protest too much. First, ecologists have long recognized a tropical deforestation crisis in the offing; for example a quick glance at the final two chapters of the 1952 classic *The tropical rain forest: an ecological study* by P. W. Richards (Cambridge University Press, New York) shows that deforestation was already an issue more than half a century ago. But graduate students then, in the 1970s, and now, are, as Francis Putz and Pieter Zuidema note in their chapter, not rewarded for taking on unwieldy interdisciplinary projects linking ecological issues with sociopolitical and cultural challenges. And a graduate student in 2009 reading either Richard’s *The tropical rain forest* or Carson and Schnitzer’s *Tropical forest community ecology* still could be forgiven for turning to the chapter of greatest theoretical interest (perhaps Egbert Leigh’s homage to mathematics with a crystal clear set of hypotheses and predictions designed to undergird dozens of dissertations) but never reaching the last section and thus continuing to ignore the human dimensions of tropical ecology.

Perhaps future volumes on tropical ecology and conservation will talk about how the world-wide network of 50-hectare plots not only provides opportunities to test explanations for the maintenance of tree species diversity (described in the chapters by Jess Zimmerman and colleagues, and Stephen Hubbell) but also discuss how this network is building intellectual capacity in-country and providing tangible evidence that setting aside reserves provides local economic benefits. Or that islands left behind large locks and dams not only provide tests for theories of island biogeography and top-down versus bottom-up control (discussed in chapters by John Terborgh and Kenneth Feeley, and Gregory Adler) but also relocated populations, upended economies, and destroyed indigenous cultures. But for now, readers will learn from Thomas Kursar and colleagues that bioprospecting can benefit Panama (or at least it could before the global economic collapse), and that rainforests are being fragmented, cleared, and burned at an appalling rate (chapters by Richard Corlett and Richard Primack, and William Laurance). Putz and Zuidema rightly note that ecologists, by focusing on the natural history, the elegant theory, and the last remnant “undisturbed” sites contribute little to actual conservation, which requires working to alleviate poverty, create economic opportunities, and evolve new structures of governance. But in a world of seven billion, soon to be 10 billion people, such work may take too long and leave us only with urban parks, buffer zones without intact cores, and managed monocultures or low-diversity “multiple-use” forests. Certainly there is ecology in these human-dominated landscapes, and in twenty years perhaps we will

know if it is the same ecology that we once studied in our “pristine” sites. *Tropical forest community ecology* may turn out to be the elegy for rainforest ecology, or it may be the harbinger of things to come. Only time will tell, but meanwhile there is much work to be done, and *Tropical forest community ecology* provides useful directions.

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Thawing, browning, burning—the boreal forest of the 21st century

Hari, Pertti, and Liisa Kulmala, editors. 2008. **Boreal forest and climate change**. Advances in Global Change Research. Volume 34. Springer, New York. xxix + 582 p. \$239.00, ISBN: 978-1-4020-8717-2 (acid-free paper).

Key words: boreal forest; climate change; ecosystem process modeling; scaling.

Boreal forest ecosystems have become the subject of much interest in recent years as the influence of climate change has become more pronounced, modifying fire disturbance regimes (burn severity, timing, and extent), altering vegetation growing season initiation and duration, changing the magnitude and trends of plant productivity, increasing the depth of seasonal thaw and mobilization of deep carbon, and, as a result of these processes, altering the balance of carbon and energy exchange. A great many peer-reviewed papers and a half-dozen edited book compilations have addressed these topics in the past decade. Some of the most compelling changes taking place in boreal ecosystems have been documented using a combination of satellite and field observations, and perhaps the most noted of these is what has become widely referred to as the “greening of the north.” Satellite indices of vegetation photosynthetic activity indicated a systematic increase over the decade since consistent global satellite coverage started in 1981.

After 1991 and particularly after 1999, however, an interesting divergence took place across the circumpolar high northern latitudes. Tundra vegetation continued a now-26 year greening trend but most boreal forest areas no longer continued greening, and many areas showed declines in photosynthetic activity (so called “browning”). The denser the forest cover in these areas, which had not burned within at least the past 50 years, the greater the browning trend. The declines are particularly apparent in late summer months when drought stress is greatest. Comparisons with meteorological measurements, tree rings, and modeling studies confirm that the boreal forest is showing the impacts of drought stress, in the form of anomalously high vapor pressure deficits—not something that was considered typical of high latitude forests.

Additional analyses confirmed another compelling example of change taking place across North America’s boreal forest, particularly in Alaska and western Canada. The extent, seasonality, and severity of burning were producing changes in the composition of tree cover, with more deciduous regrowth replacing the previously conifer-dominated forests. The extent and frequency of more severe fires resulted in greater

consumption of organic matter, and deciduous vegetation was flourishing on mineral soils that were exposed from beneath centuries-old peat deposits that had burned off. In these areas, a more deciduous and more productive vegetation cover was sharply contrasted with the declining productivity of yet unburned forests suffering the impacts of drought. Greater depths of active layer thawing add yet more change to the now-dynamic mix, with some areas becoming drier, more prone to fire, and losing surface ponds to drainage—while other more poorly drained areas became wetter and formed new ponds. All of these changes have been documented over great geographic extents, yet changes taking place at any given location in the boreal biome can be quite different from those in another location just a few kilometers away.

In this context, it is difficult to generalize measurements taken at a given boreal forest site, yet such measurements are essential to our understanding of the processes driving change and the knowledge needed to develop robust models of the processes involved. This is particularly true given the relative lack of intensive, systematic, long-term measurements in boreal environments, which is why *Boreal forest and climate change* is a much-needed addition to the literature on the subject. The book is focused on a now-three-decade record monitoring and modeling processes and exchanges among vegetation, soil, and atmosphere at sites across Finland. Nominally organized around a set of theories (a “metatheory”) dealing with these efforts in the context of climate change, the book provides detailed, nicely illustrated insights into both conceptual and mechanistic process models describing aspects of these theories and associated processes, their interactions, and scale dependence.

Aside from the relatively brief introductory and concluding chapters, there are nine substantive well-cited sections dealing with the overall methodological approach (field measurements, statistical methods, process modeling), environmental factors (their temporal and spatial variability), transport (molecular, convective, radiative), aspects of structure (in vegetation, soil, and atmosphere), physical and chemical processes (in vegetation and soil), scaling of processes and transport, connections among structure, processes, and transport, a mechanistic model of forest growth (MicroForest), and finally (as per the book’s title) the interactions and feedbacks between boreal forests and climate change. One of the two editors (usually Pertti) co-authored each section, and all of the contributors to the book are forest ecologists and physicists based at the University of Helsinki. This close connection, which evolved over several research generations of collaboration with Soviet counterparts, grew out of initial measurements and forest growth model

development started in the late 1970s. The intensive focus of their work, developing a system for measuring ecosystem-atmosphere relations (SMEAR), is apparent in the tightly woven structure of the book, which is highly quantitative and often quite technical in its coverage of nearly every aspect of biophysical ecology. At the same time, the introductory and background chapters, and much of the context material in the primary content sections, is written in a general style suitable for an advanced-level textbook on the subject. Predominantly, however, the book is most appropriate as a high-level scientific treatise for those with a keen interest in the biophysical aspects of measuring and modeling ecosystem-atmosphere exchange.

The book's particular strength is the depth of material on the fundamental mechanisms by which exchanges (transport) occur between the components of the boreal ecosystem and the atmosphere, as well as the related sections on model development and process scaling. I was particularly pleased to see meaningful treatment of drought impacts on forest photosynthesis, quantitative descriptions of canopy structure attributes and component fluxes, and how these vary with stand age. These are just a few examples of the exhaustive depth of the book's focus on biophysical ecology. Its weakness, the limited geographic extent of the work, is forgivable given the intensive nature of the measurements and model development at sites dominated by Scots pine (*Pinus sylvestris*) within Finnish boreal ecosystems. I would also have liked to see more substantive links with synoptic scale observations, such as those from

satellite systems now routinely used for scaling site measurements to larger spatial domains. Nonetheless, when coupled with the few other sites where similar intensive measurements have been conducted (albeit over much shorter time scales) the work documented in *Boreal forest and climate change* is the basis upon which the broader scale changes taking place across the circumpolar boreal biome can be best quantified and placed in the context of the fundamental principles upon which the system functions, and how structure and scale influence the transport of energy, water, and carbon through the system.

My hope is that the intensive studies described here provide incentives for an expansion to additional locations across the boreal biome, more adequately representing the spruce-dominated forests of North America and larch dominated ecosystems of northern Eurasia. Given the pace at which change is proceeding, time is of the essence. In the interim, this book is a veritable treasure trove of information on the subject.

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Superdove? How humans facilitated the success of the Rock Pigeon

Humphries, Courtney. 2008. **Superdove: how the pigeon took Manhattan ... and the world.** HarperCollins, New York. ix + 196 p. \$24.95, ISBN: 978-0-06-125916-6 (acid-free paper).

Key words: *Columbiformes; domestication; Rock Pigeon; urban ecology.*

The paradox of the Rock Pigeon (*Columba livia*) is that it is ubiquitous in human society and yet often overlooked, unappreciated, and perhaps even reviled. Yet, as fledgling science writer Courtney Humphries eloquently points out throughout *Superdove*, it is humans who deserve the lion's share of credit for the success of this species. Although wild Rock Pigeons may be adaptable, resourceful, precocial, and profligate, Humphries hypothesizes that humans spread pigeons throughout the world and provided selective advantages, both through artificial selection and through domestication, that enabled feral pigeons to exploit the edifices and resources of human civilization. As befitting her hypothesis, this book is as much about humans as it is about pigeons.

Although the front flap of the book suggests this is a "natural history of the pigeon," it is not. It is a travelogue of Humphries' growing appreciation and knowledge of pigeons, culminating in hours spent in gritty urban alleys observing their behavior and sampling their gamey flesh in a refined restaurant. However, it is the interaction between pigeons and humans that seems to capture her imagination. One aspect of these interactions is the ways in which humans domesticated and bred pigeons that have ultimately benefited pigeons. The other perspective explored,

often with humor and insight, are the many ways in which those interactions have benefited humans. Pigeons may have been among the first domesticated birds. Pigeons may have been domesticated because they were first attracted to and settled in among humans, rather than after being captured and confined by humans. Once humans settled in agrarian societies, pigeons may have abandoned their preference for nesting on cliffs and settled in cities, where buildings provided nesting sites similar to cliffs, but closer to grain fields. Providing housing for them (dovecotes) enabled humans to harvest the squabs, but the costs of keeping pigeons were low because pigeons were good at foraging for themselves and reliably returned to the dovecote. Able to mate and forage on their own, pigeons learned to live with humans, benefit from the association, but still retain many of their wild skills. Because pigeons were useful to humans, we brought them with us as we expanded our range and we provided habitats for them as we modified our own.

Charles Darwin began *On the origin of species* with a discussion of selective breeding of domestic pigeons. He chose pigeons as the introduction to his theory of natural selection because pigeons were highly variable and changed as a result of selective breeding. If Victorian society could embrace this, the result of "a harmless gentleman's hobby," they might extend that perception to the natural world. Of course, the ornamentation and traits selected by "pigeon fanciers" have no opposing selective forces—no predators to pick off the ungainly or conspicuous. Selection is driven entirely by human aesthetics. Humphries uses "fancy pigeons" as a foil to illustrate the variability of the species and the difficulty this imposes on our ability to define it. Clearly fancy pigeons, such as the elaborately ruffed Jacobins or the overstuffed Modenas, are

not wild birds, but where does the line between domestic, feral, and wild pigeon fall? Unlike many, if not most birds, Rock Pigeons enjoy few legal protections and often are considered invasive exotics, an exceedingly negative label these days. However, Humphries points out that “the perfect invasive species—one that is mobile, spreads quickly, modifies its ecosystem, and drives other species to extinction—is our own.” This again is the paradox—ultimately we are responsible for the spread and success of Rock Pigeons. Arguably, Rock Pigeons have settled into a vacant niche in our cities with few if any consequences to our native columbids.

Despite the apparent success of Rock Pigeons in our urban environments, it is surprising how strong an influence food provided by humans specifically for pigeons plays in their apparent population regulation. In Basel, Switzerland, over 90% of the food used by pigeons comes from humans, with the vast majority coming “from a small group of people feeding the pigeons.” Pigeon Mothers, as Humphries portrays them, an easily imaged iconic urban symbol sitting on a park bench with a bag of grain, can alter the behavior of entire pigeon populations, reducing the time needed for foraging that might profitably be invested in reproduction. Although the book does not explore the exact demographic mechanism, if such anthropogenic feeding is eliminated, populations may decline by 70–80%. The ecological effect of changes in the spatial and temporal variation in food availability with human density on avian community structure is a recurrent theme in urban ecology.

Indeed, this book is full of useful insights for urban ecologists. Urban ecology is all about “how people shape the habitats of species that live near and among us” and a book on the complex and historical interactions between humans and pigeons that have shaped today’s urban avifauna should be

relevant to any ecologist, urban or otherwise. For those ecologists who immediately identify themselves in the “other-wise” camp, this book helps clarify the extent to which humans have shaped our natural world; we are all “urban” ecologists to some degree. Humphries quotes Dr. Richard Johnston, reflecting a western worldview that is not yet thoroughly vanquished from modern ecology—“Because humans think of their activities as different from ‘nature,’ they are deemed artifacts, derived from human skills—not natural.” This perception has steered many ecologists away from studying organisms in urban settings. But the evidence amassed in this book, pointing out the numerous ways in which humans have facilitated the success of Rock Pigeons demonstrates that we are “... a force of nature. We create and destroy habitat, we shape genomes, we aid the worldwide movement of other species.” This interesting and well-written book provides fodder for anyone imagining research or a career as an urban ecologist. Although the book has neither a literature cited section nor an index, frustratingly complicating the ability to learn beyond the written words, a bibliography provides prose descriptions of some of the author’s resources. I found a few typographical errors, but the overall quality is high. I recommend it to anyone with an interest in birds and/or pigeons, evolution, or urban ecology.

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Spotlight

RECENT PUBLICATIONS OF PARTICULAR INTEREST

Davis, Jack E. 2009. **An Everglades providence: Marjory Stoneman Douglas and the American environmental century.** The University of Georgia Press, Athens, Georgia. xxv + 758 p. \$34.95, ISBN: 978-0-8203-3071-6 (alk. paper). This book weaves together the story of Everglades protection with the 108-year life of Marjory Stoneman Douglas, probably the most important person in establishing protection of the Everglades. Besides being an environmental activist, Douglas was a suffragist and a supporter of the Equal Rights Amendment (imagine!); she also worked for social justice and wrote widely.

Silvertown, Jonathan, editor. 2008. **99% ape: how evolution adds up.** The University of Chicago Press, Chicago, Illinois. 224 p. \$26.00, ISBN: 978-0-226-75778-0 (alk. paper). In this year of the 150th anniversary of the publication of the *Origin of species*, we will see many books on Darwin and evolution. This one is profusely illustrated with chapters grouped into sections on the origins of evolutionary ideas, evolution of body structures, speciation, and current views of evolution.

BOOKS AND MONOGRAPHS RECEIVED THROUGH FEBRUARY 2009

- Allen, Micheal S., Steve Sammons, and Michael J. Maceina, editors. 2008. **Balancing fisheries management and water uses for impounded river systems**. American Fisheries Society, Symposium 62. American Fisheries Society, Bethesda, Maryland. x + 697 p. \$69.00, ISBN: 978-1-934874-06-6 (acid-free paper).
- Allsopp, Michelle, Richard Page, Paul Johnston, and David Santillo. 2009. **State of the world's oceans**. Springer, New York. xiv + 256 p. \$79.95, ISBN: 978-1-4020-9115-5 (acid-free paper).
- Alongi, Daniel M. 2009. **The energetics of mangrove forests**. Springer, New York. xi + 216 p. \$179.00, ISBN: 978-1-4020-4270-6 (acid-free paper).
- Apfelbaum, Steven I. 2009. **Nature's second chance: restoring the ecology of Stone Prairie Farm**. Beacon Press, Boston, Massachusetts. xiv + 242 p. \$25.95, ISBN: 978-0-8070-8582-0 (alk. paper).
- Cheplick, Gregory P., and Stanley H. Faeth. 2009. **Ecology and evolution of the grass-endophyte symbiosis**. Oxford University Press, New York. ix + 241 p. \$75.00, ISBN: 978-0-19-530808-2 (acid-free paper).
- Davis, Jack E. 2009. **An Everglades providence: Marjory Stoneman Douglas and the American environmental century**. The University of Georgia Press, Athens, Georgia. xxv + 758 p. \$34.95, ISBN: 978-0-8203-3071-6 (alk. paper).
- Drengson, Alan, and Duncan Taylor. 2009. **Wild foresting: practising nature's wisdom**. New Society Publishers, Gabriola Island, Canada. xii + 307 p. \$24.95, ISBN: 978-0-86571-616-2.
- Dunning, John B., Jr. editor. 2008. **CRC handbook of avian body masses**. Second edition. CRC Press, Boca Raton, Florida. ix + 655 p. + CD-ROM. \$119.95, ISBN: 978-1-4200-6444-5 (alk. paper).
- Dusenbery, David B. 2009. **Living at micro scale: the unexpected physics of being small**. Harvard University Press, Cambridge, Massachusetts. xxx + 416 p. \$49.95, ISBN: 978-0-674-03116-6 (alk. paper).
- Ebi, Kristie L., Ian Burton, and Glenn R. McGregor, editors. 2009. **Biometeorology for adaptation to climate variability and change**. Biometeorology. Volume 1. Springer, New York. viii + 281 p. \$189.00, ISBN: 978-1-4020-8920-6 (acid-free paper).
- Gray, John S., and Michael Elliott. 2009. **Ecology of marine sediments: from science to management**. Second edition. Oxford University Press, New York. xiii + 225 p. \$130.00 (cloth), ISBN: 978-0-19-856901-5 (acid-free paper); \$60.00 (paper), ISBN: 978-0-19-856902-2 (acid-free paper).
- Harper, David, Maciej Zalewski, and Nic Pacini, editors. 2008. **Ecohydrology: processes, models and case studies: an approach to the sustainable management of water resources**. CABI, Cambridge, Massachusetts. ix + 391 p. \$150.00, ISBN: 978-1-84593-002-8 (alk. paper).
- Haupt, Sue Ellen, Antonello Pasini, and Caren Marzban, editors. 2009. **Artificial intelligence methods in the environmental sciences**. Springer, New York. viii + 424 p. \$159.00 (cloth), ISBN: 978-1-4020-9117-9 (acid-free paper); \$89.95 (paper), ISBN: 978-1-4020-9118-6 (acid-free paper).
- Kohli, Ravinder Kumar, Shibu Jose, Harminder Pal Singh, and Daizy Rani Batish, editors. 2009. **Invasive plants and forest ecosystems**. CRC Press, Boca Raton, Florida. xv + 437 p. \$129.95, ISBN: 978-1-4200-4337-2 (acid-free paper).
- Malchow, Horst, Sergei V. Petrovskii, and Ezio Venturino. 2008. **Spatiotemporal patterns in ecology and epidemiology: theory, models, and simulation**. Mathematical and Computational Biology Series. CRC Press, Boca Raton, Florida. 443 p. + CD-ROM. \$93.95, ISBN: 978-1-58488-674-7 (alk. paper).
- McDowell, Richard W., editor. 2008. **Environmental impacts of pasture-based farming**. CABI, Cambridge, Massachusetts. xiii + 283 p. \$150.00, ISBN: 978-1-84593-411-8 (alk. paper).
- Ochyra, Ryszard, Ronald I. Lewis Smith, and Halina Bednarek-Ochyra. 2008. **The illustrated moss flora of Antarctica**. Cambridge University Press, New York. xvii + 685 p. \$250.00, ISBN: 978-0-521-81402-7.
- Quammen, David. 2009. **Natural acts: a sidelong view of science & nature**. Revised edition. W.W. Norton, New York. 350 p. \$15.95, ISBN: 978-0-393-05805-5.
- Rice, Stanley A. 2009. **Green planet: how plants keep the Earth alive**. Rutgers University Press, New Brunswick, New Jersey. xiii + 298 p. \$27.95, ISBN: 978-0-8135-4453-3 (alk. paper).
- Romesburg, H. Charles. 2009. **Best research practices: how to gain reliable knowledge**. Lulu Enterprises, Morrisville, North Carolina. iv + 229 p. \$29.75, ISBN: 978-0-557-01783-6.
- Ruse, Michael. 2009. **The evolution wars: a guide to the debates**. Second edition. Grey House Publishing, Millerton, New York. xiv + 732 p. \$145.00, ISBN: 978-1-59237-288-1.
- Schipper, E. Lisa F., and Ian Burton, editors. 2009. **The Earthscan reader on adaptation to climate change**. Earthscan, Sterling, Virginia. xx + 459 p. \$136.50 (cloth), ISBN: 978-1-84407-530-0; \$38.95 (paper), ISBN: 978-1-84407-531-7.
- Silvertown, Jonathan, editor. 2008. **99% ape: how evolution adds up**. The University of Chicago Press, Chicago, Illinois. 224 p. \$26.00, ISBN: 978-0-226-75778-0 (alk. paper).
- Thomas, Frédéric, Jean-François Guégan, and François Renaud, editors. 2009. **Ecology and evolution of parasitism**. Oxford University Press, New York. xiii + 224 p. \$150.00 (cloth), ISBN: 978-0-19-953532-3 (acid-free paper); \$70.00 (paper), ISBN: 978-0-19-953533-0 (acid-free paper).
- Turner, Tom. 2009. **Roadless rules: the struggle for the last wild forests**. Island Press, Washington, D.C. xiv + 171 p. \$55.00 (cloth), ISBN: 978-1-59726-439-6 (alk. paper); \$27.50 (paper), ISBN: 978-1-59726-440-2 (alk. paper).
- Weart, Spencer R. 2008. **The discovery of global warming**. New Histories of Science, Technology, and Medicine. Revised edition. Harvard University Press, Cambridge, Massachusetts. x + 230 p. \$16.95, ISBN: 978-0-674-03189-0 (alk. paper).
- Wehrmann, Ingo S., and Jorge Cortés, editors. 2009. **Marine biodiversity of Costa Rica, Central America**. Monographiae Biologicae. Volume 86. Springer, New York. xxxiv + 538 p. + CD-ROM. \$149.00, ISBN: 978-1-4020-8277-1 (acid-free paper).