In summary, this edited volume by Collinge and Ray is an admirable contribution to the study of infectious diseases and parasitology. It amply illustrates that focusing on simple host–parasite species pairs is often insufficient for understanding the emergence and prevalence of diseases, in both human and wildlife populations. Taking a community perspective not only broadens our knowledge but it also provides for a much sounder predictive theory of disease dynamics. It is an exciting time for people working in this area because so much work remains to be done. This superb volume is required reading for anyone interested in enjoying and contributing to this rapidly growing field of research.

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Intertidal Life as Experienced Through a Powerful Lens

Koehl, Mimi. 2006. **Wave-swept shore: the rigors of life on a rocky coast**. University of California Press, Berkeley, California. x + 179 p. $39.95, ISBN: 0-520-23812-5 (alk. paper).

Key words: biomechanics; biophysical ecology; intertidal zone; microhabitat.

It is often said that it takes a true expert to see the world at its most basic, fundamental level. In their recent book, *Wave-swept shore*, Mimi Koehl and Ann Wertheim Rosenfeld clearly demonstrate how their vast experience of poking around the world's shorelines has resulted not only in an intimate knowledge and understanding of the workings of the creatures that live there, but also an appreciation of the beauty of the rocky intertidal zone. *Wave-swept shore* introduces readers to the diversity of microhabitats along the California coast using text (written by Koehl) and an extensive set of exquisite color plates (by Wertheim). Early in the book, Koehl emphasizes that the goal of the book is to describe "how" organisms interact with their physical environment through biophysics. She refers the reader to other texts on ecological interactions and evolution to explain the ultimate "why" of adaptation and biogeographic distribution. In other words, Koehl's main goal in this book is to explore the variability in the physical environment at the microhabitat level, and the means by which organisms interact with their surroundings. She does so through via the techniques of biophysical ecology (i.e., heat, mass, and momentum transfer) in a way that is both understandable and accessible to a nonspecialist audience, yet is technically very correct.

While the concepts touched upon in this book are important to modern ecological theory, this is clearly not a book written for technogeeks and others wishing to learn the detailed minutiae of biophysical ecology pioneered by Koehl and colleagues, nor is it a text suitable for classroom use. No primary literature is referenced, and explanations of physical phenomena do not go far beyond a series of intuitive examples. Instead, this book is an exploration of intertidal life from the perspective of the organism, written to draw nonscientists into the world of intertidal ecology and to convince the noninitiate as to the power of applying engineering principles to intertidal ecology. In this regard, Koehl succeeds admirably. Moreover, this book will also be enjoyed by anyone simply wanting to take a romp through the intertidal zone as seen through the eyes of one of the field's top practitioners, and the lens of an outstanding photographer. This was a very enjoyable book to read, and offers insights that will appeal to a diverse audience. While clearly intended for nonscientists or those at the early stages of their careers, the book also provides a surprisingly thorough introduction to the biophysical ecology of the intertidal zone and is worth reading by experts if for no other reason than for the photography alone. The photographic plates are astoundingly beautiful, and in both the text and the plates the authors do an amazing job at driving home how much diversity and beauty can be found in a single kilometer of rocky coastline. This book is therefore highly complementary to more technical books such as Mark Denny's *Biology and the mechanics of the wave-swept environment* (1988. Princeton University Press, Princeton, New Jersey, USA). One strength of *Wave-swept shore* is that it will draw audiences to the idea that art and biophysics need not be viewed as completely separate disciplines, and that biophysics has relevance to everyday life. This is not a coffee table book, however, and it is surprisingly complete in its coverage of biophysical techniques. Koehl introduces topics such as drag, particle transport, and heat exchange, using examples that will be familiar to most readers, and the text ties logically to the color plates and to the few well-drawn diagrams. Again, while the level of detail is not sufficient for an undergraduate majors class, I doubt that this is the audience for whom it was intended. Instead, this book is perfect for anyone who wants a first-class introduction to what it truly feels like to be an organism living on a rocky coastline. Perhaps more importantly it provides a very gentle and unintimidating introduction to biophysical ecology, explaining in relatively simple terms why nonhuman organisms experience their physical world in such fundamentally different ways than the researchers who study them.

The authors provide an excellent combination of stunning photography and very readable prose to walk the reader through a diversity of intertidal microhabitats, and use uncluttered diagrams to describe some of the underlying physics that affect the organisms that inhabit this ecosystem. Notably, this book deliberately shies away from using equations to explain physical principles, but instead relies on "common sense" examples such as the principle of continuity (put your finger over the end of a garden hose and the water velocity increases). While the underlying principles are presented in a very unassuming manner, they are in no way "dumbed down." Whereas analogies are used to convey ideas, they are, unlike many books and articles written for lay audiences, technically correct, and in many cases reflect the most recent advances in the field. The book touches most aspects of biophysical ecology, including flow and wave forces (boundary layer formation, drag, lift, etc.), mass transfer (nutrient and gas

exchange) and determinants of body temperature (heat exchange). This extensive coverage of such a diversity of topics highlights one huge advantage of having someone of Koehl's caliber write a book such as this: Koehl is as intimately familiar with the physics as she is the intertidal zone, and she explains complex engineering principles in simple terms without obfuscation or inaccuracy. My one (very minor) complaint is that I do wish she had thrown some mathematics into the mix—while a bit scary to some audiences, math too can be beautiful in its own way, and in showing how counterintuitive nature can be. Nevertheless, this book will serve to draw in a host of new initiates who will delve deeper into intertidal ecology and biophysical ecology, and may even cause several old salts to view intertidal ecology through a new lens.

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Renewing The Dialectic of Food-Web Research

Pascual, Mercedes, and Jennifer A. Dunne, editors. 2006. **Ecological networks: linking structure and dynamics in food webs.** Santa Fe Institute Studies in the Sciences of Complexity. Oxford University Press, New York. xviii+ 386 p. $64.50, ISBN: 0-19-518816-0.

Key words: complexity; food webs; graph theory; networks; trophic structure.

The ongoing dialectic of science—initial theories giving way in the face of better data, which inspire more sophisticated analysis, which in turn is confronted with still more detailed data—is displayed clearly in the study of food webs. For more than a century, approaches to studying food webs have oscillated between compilations of detailed natural history observations into illustrations of trophic relationships and the search for, and statistical analysis of, general patterns of food-web structure. The search by food-web theorists in the 1970s for general metrics of food webs, such as linkage density and connectance (summarized in the proceedings of the first international food-web symposium: DeAngelis, D. L., W. M. Post, and G. Sugihara, editors. 1983. *Current trends in food web theory*. Oak Ridge National Laboratory ORNL-5983, Oak Ridge, Tennessee, USA), was scorned by the empiricists of the 1980s who emphasized natural history detail and environmental variability (summarized in the proceedings of the second international food-web symposium: Polis, G. A., and K. O. Winemiller, editors. 1996. *Food webs: integration of patterns and dynamics*. Chapman and Hall, New York, New York, USA). In true dialectic fashion, the third international symposium (de Ruiter, P., V. Wolters, and J. C. Moore, editors. 2005. *Dynamic food webs: multispecies assemblages, ecosystem development and environmental change*. Elsevier, Burlington, Massachusetts, USA) synthesized these two approaches and provided myriad directions for novel theoretical work and simultaneously pointed out key empirical lacunae.

Ecological networks opens the next dialectical cycle. The product of an international workshop held at the Santa Fe Institute in February, 2004 (just three months after the third international food-web symposium), the focus of this volume is on new general models and metrics of food-web structure. New insights are gained from cross-fertilization of ecological models with models of other complex networks that include the internet and World Wide Web, social and financial networks, and protein interaction networks. All of these approaches, including the models of food-web structure presented in the book's 15 chapters, use language and methods of graph theory. Many of the illustrations are done using the FoodWeb3D software ⟨http://www.foodwebs.org⟩.

As the subtitle suggests, the contributors address both the structure and dynamics of complex networks, of which food webs are a special case. The four chapters in the first section (following the introduction), accounting for nearly half the book, present different ways of quantifying food-web structure. Jennifer Dunne provides a lengthy review of the history of food-web studies; her attention to historical gems unknown to many contemporary ecologists is most welcome. Cecile Cartozo et al. introduce the language of graph theory and its application to quantifying food-web structure. Andy Dobson et al. illustrate the added complexity that parasites add to food webs, while Jordi Bascompte and Pedro Jordano expand the discussion to include networks of coevolutionary mutualists. The remaining three sections of the book attempt to illustrate how these new metrics food-web structure change as food webs change through time. Of these nine chapters, two are real stand-outs.

James Gillooly et al. show how the evolving metabolic theory of ecology (a.k.a. Jim Brown's "theory of everything"; Brown, J. H., J. F. Gillooly, A. P. Allen, V. M. Savage, and G. B. West. 2004. Toward a metabolic theory of ecology. *Ecology* 85:1771–1789) might be used to link food-web models based on abundances and trophic dynamics to those based on energy fluxes. Their nascent model may lead to a rapprochement between classical "community" and "ecosystem" approaches to ecological dynamics. Or it may not. But either way, interesting data will be collected along the way. Jane Memmott et al. discuss the relationship between the structure of complex ecological networks and the loss of biodiversity. They focus on the role of habitat structure, species interactions, and minimum viable areas for maintaining resilient, functioning food webs. Each section of their chapter includes a clear discussion of what is known (not much) and what needs to be known (a lot) in order to apply food-web theory to the conservation and restoration of ecosystems and their biological diversity. There are literally dozens of dissertation topics waiting for enthusiastic graduate students in this chapter alone.

In most new theses, much is left out, and *Ecological networks* is no exception. Stable isotopes, a now common part of the empirically minded food-web ecologist's tool-kit, are nowhere evident. The role of body size and the abundance of individuals at each node in the food web, a large focus of the 2003 international food web symposium, are similarly absent.