

book review

An integrative overview on alpine habitats

The Biology of Alpine Habitats, by Laszlo Nagy & Georg Grabherr
Oxford University Press, 2009, 336 pp. ISBN13: 978-0-19-856703-5
<http://www.oup.com/>

Mountains, and specifically alpine habitats, are fragile and extremely sensitive to perturbations, because of intense gravity effects on flows of energy and materials. As a consequence, they are highly exposed to global change impacts. Understanding the abiotic and biotic patterns and processes involved in alpine habitats is not only of utmost importance for researchers interested in mountain regions, but also for those looking to gain deeper insights in current biological debates, such as the effects of nutrient limitations on species diversity, dispersal/colonization dynamics and niche space filling, the changing nature of species interactions in harsh habitats, or impacts of global change in “nowhere to go” habitats. Nagy and Grabherr’s *The Biology of Alpine Habitats* deals, among others, with those topics and it is a neat inspection of the upper part of mountains, their constituent elements and the challenges that they face under global change.

The book is organized in eleven chapters. The first part (chapters 1, 2, and 3) focuses on defining alpine habitats, describing the different mountain regions across the globe from high latitudes to the tropics, and also the distribution of the main abiotic and biotic factors along elevational gradients. The second part of the book (chapters from 4 to 8) describes the main abiotic factors constituting alpine habitats, such as energy, climate, landforms, hydrology and soils, and the relation of these factors to alpine communities. These first two parts of the book provide the necessary foundations to discuss global change impacts on climate, nitrogen deposition and land uses in alpine habitats, and to offer a brief summary on conservation issues (chapters 9 and 10).

The way the authors frame and organise the book provides the reader with the chance to surf smoothly across the key elements constituting alpine habitats and the relationships between these elements. This easy-to-follow flow also con-

tinues when it comes to integrate the variety of spatial and temporal scales in which the drivers shaping current alpine habitats operate: from explanations of the evolutionary and biogeographic processes behind the formation of alpine floras and their traits, to the role of species interactions and their specific abilities in the colonization of new areas. This journey across scales allows Nagy and Grabherr to integrate knowledge that belongs to disciplines such as geology, climatology, biogeography, community ecology or eco-physiology. Their definition of ecological communities (“...*net outcome of all biotic interaction and abiotic constraints in a given location at a given time, with a given background of history, species pool*”) illustrates the integrative perspective in which this book is framed.

The role of historical biogeographic processes to explain the formation of alpine floras and current alpine biodiversity patterns is explicitly discussed in Chapter 7. Readers will find that the authors highlight how biogeographical disciplines such as phylogeography (Box 7.1) are of utmost interest for linking past dynamics and structure of alpine populations with current biodiversity patterns. An excellent idea was to devote the last part of this chapter to the adaptation and survival of alpine organisms. In doing this, the authors recognise the evolutionary foundations of issues that have been often perceived as pure ecological phenomena, such as eco-physiology or reproduction (adaptations to alpine existence across different time scales are summarized in Fig 7.12). This integration of evolutionary and ecological aspects in a biogeographical framework to better understand adaptation and survival abilities of alpine habitats provides a robust venue to better discuss future responses of alpine biodiversity to global change.

In summary, *The Biology of Alpine Habitats*, which is part of the Habitat Series published by Oxford University Press, intends to provide stu-

dents and scientists embarking on alpine research with an integrative overview on alpine habitats. The book largely fulfils this aim, providing clear descriptions of relevant theories and hypotheses, describing general and broad patterns in alpine habitats across different mountains of the world but at the same time highlighting regional or local deviations from these global trends, and offering significant supplementary information to the text in the form of pictures, plots, graphs and tables. There are some issues that would need more work, such as a better integration of animal assemblages in alpine habitats (the book mainly focuses on plant communities), or a deeper explanation of future climate impacts in alpine biodiversity. Also, and although the text flows smoothly, there are some parts of the chapters that are embedded without a logical connection to their previous or following parts. One of these parts, for example, is devoted to species richness and the applicability of the theory of island biogeography to the alpine zones of the mountains, which ap-

pears between a pure descriptive introduction to the biogeography of the different mountain regions and a section on the evolution of alpine organisms. However, these are just minor issues and the book by Nagy and Grabherr is highly recommended for its exhaustive and integrative provision of current knowledge on alpine habitats.

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book review

All islands in a large nutshell

Encyclopedia of Islands, by Rosemary G. Gillespie and David A. Clague (eds)

Encyclopedias of the Natural World, vol.2, August 2009, 1111 pp. ISBN: 978-0-5202-5649-1

<http://www.ucpress.edu/>

This beautiful book starts with a very bold claim: “The *Encyclopedia of Islands* is a comprehensive, complete, and authoritative reference dealing with all of the physical and biological aspects of islands and island habitats” (p. xxix – the first sentence of Guide to the Encyclopedia, which opens the book after the contents and contributor listings). Similarly, on the book’s website Jonathan Losos is quoted as saying that the book “is a comprehensive compendium of all topics related to islands and the science conducted on them.” I cannot agree with such hyperbole, which represents a near-unachievable ideal. Nor, it seems, do the authors themselves agree: “The *Encyclopedia* functions as ingress into a body of research only summarized herein” (p.xxx). Even so, and despite its faults, I do recommend this book to anyone with any sort of interest in islands.

At £65 or US\$95 the book is expensive for a coffee-table volume, but good value for an academic work of its size and publication quality. So which is it? I am not sure. The back cover (see also “Description” on the website) also suggests confusion over the intended role: “This essential, one-stop resource... will introduce island science to a wide audience and spur further research on some of the planet’s most fascinating habitats.” The Guide to the Encyclopedia says the book provides “a broad overview of the current state of knowledge... intended for students as well as the interested general public” (p. xxix), but later on same page: “The articles... are all intended for the interested general public.” The book is largely jargon-free and technical terms are not over-used; most of those that are used are defined in a 30-page Glossary, with over 900 terms, which is itself a