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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

useful resource.

The emphasis on the interested general public seems to be responsible for what I regard as the book's biggest weakness: failure to cite sources. A decision was clearly made, by the editors or the publishers, to instruct contributors to provide short lists of further reading, mostly textbooks and review articles, but no in-text citations or accompanying reference lists. So it is nearly impossible for readers to establish the source of much of the information presented. This is extremely annoying, severely reduces the book's value as a reference and effectively represents plagiarism. It seriously compromises stated aims to guide readers "to the vast literature on island science" (p. xxxi). It is also a bad example to students. I find it very annoying when writing contributions to similar compendia, under similar rules: at universities we sweat blood to get our students to cite their sources and reference properly, sometimes punishing them severely for plagiarism, only to direct them to our own published work in which these rules are broken. I wish this practice of forcing authors not to cite their sources would stop. I think the general public is able to cope with the concept of sources being cited and should not be patronised in this way. If publishers insist on trying to 'de-clutter' the text (by prohibiting in-text citations) to maximise readability then there are ways of doing so that retain the key information. A good example is Bill Bryson's excellent *A Short History of Nearly Everything*.

There is much that is good about the book. It is well presented and illustrated: though the quality and quantity of illustration varies between articles, most of the abundance of photos, maps and drawings are very high in quality. Coverage is nearest to complete for biological and geological aspects of islands, although the treatment of biogeography is not very satisfying: the heading "Biogeography" is simply used to group together the "Biology" articles for all the first-category islands (see next paragraph). I like the broad definition of 'island' as "any discrete habitat isolated from other habitats by inhospitable surroundings." Thirty island types, each covered in a dedi-

cated article, include organic falls on the ocean floor and a separate entry for whale falls, seamounts, cold seeps, *Lophelia* oases and mountain-tops (colourfully termed "Sky Islands"). Even the most knowledgeable reader will surely learn something by browsing through these articles, and those on other types such as Kīpuka, Makatea, Motu and Pantepui. Islands are considered from a pleasing range of viewpoints: headings under which articles are listed include various categories of 'true' islands (see next paragraph); island types; concepts relating to ecology and evolution, geology, oceanography and climatology; notable plants and animals; "Human Impact"; and "History and Pre-history". Perhaps the most useful pages of all are the "Contents by subject area" (pp. xi-xiv), which elucidate not only the organisation of the book, but also some of the aims and philosophy behind it, putting the reader on more-or-less the same wavelength as the editors.

From my own reading of the book, 'true' islands and archipelagos seem to fall into five categories. First, principal ones (my term). Each of these has two full articles, one each on the geology and the biology: Antarctic Islands, Antilles, Arctic Islands, Canary Islands, Californian Channel Islands, Fiji, French Polynesia, Galápagos Islands, Great Barrier Reef Islands, Greek Islands, Hawaiian Islands, Indonesia, Japan's Islands, Macquarie, Marianas, Mascarene Islands, New Caledonia, New Guinea, New Zealand, Philippines, Samoa, Solomon Islands, Taiwan. One could argue about the circumscription of some of these in political units rather than biogeographic ones (especially in the Wallacean region), but more importantly I question the validity of this list as the implied most important islands on the planet. While all these islands are clearly globally significant, do some of them (such as Fiji, Samoa, Californian Channel Islands) really deserve this top status when Madagascar, for example, does not? The second category is those islands listed under the heading "Important Islands", each with one article of its own. These islands range from Madagascar to Warming Island (off Greenland), and the Cook Islands to Cozumel (off Mexico). Third, some islands have articles to themselves, but are listed

under the heading “History and Pre-history” (Barro Colorado Island, Tierra del Fuego, Pitcairn, Midway and Tatoosh – note the bias toward the Americas). Fourth are islands mentioned somewhere, but without articles devoted to them or their archipelago. These are quite well indexed at the end of the book, though errors can cause hindrance, such as when I was looking for mention of the British island Lundy: this is incorrectly indexed as “Lunday”. (Also the island of Great Britain is labelled “Britain”.) Finally come the islands with no mention anywhere in the book. Surprise omissions include the Bay Islands of Honduras, to which there are regular, direct international flights from Italy.

Some of the world’s most significant islands, by any standards, such as Greenland (stated as the world’s largest island), Sulawesi and Sumatra, only get only very short sub-sections in articles on major archipelagos (Arctic Islands, Indonesia). Meanwhile, Wizard Island (a tiny island in Crater Lake, Oregon, USA), Fernando de Noronha (a small archipelago off Brazil), Rottneest (a small holiday island in Western Australia with little terrestrial ecosystem left), among other surprising choices, have full articles to themselves, under the heading “Important Islands”. It is also odd that Borneo gets its own article while Sumatra, Java and Sulawesi do not and all of these islands are covered under “Indonesia”.

The list of 300 contributors reads a bit like a hall of fame of people who research islands. Most contributors have only one article, a few have two and only Rosemary Gillespie has three. This appears to be a genuine attempt to get buy-in from as many places as possible. Certainly the contributors come from all around the world, and both the content and the author list are, at first sight at least, reassuringly global in coverage. Closer inspection, however, reveals considerable bias towards North America (particularly) and Europe. In terms of contributors, nearly half of the 300 people listed have North American institutional addresses and only a quarter are not listed as working in Europe or North America. Institutional addresses all end with the country, except for those in the USA, where this appears to have been

deemed unnecessary. I was confused for a moment by Dennis Geist’s entry: “University of Idaho, Moscow”. Twenty-six of the 300 contributors are from Hawaii! Hawaii also illustrates bias in the contents. The disappointing article by Mueller-Dombois entitled “Vegetation”, for example, would be better named “the vegetation of Hawaii”. In the “Lava Tubes” article by Kauahikaua *et al.*, the Kīlauea volcano is mentioned, with no indication of where in the world it is, nor is it listed in the Index; you are simply expected to know that it is in Hawaii. Reading through the book, you soon learn to default to the USA if information to the contrary is not provided. One can find other types of bias: of the 24 articles listed under “Plants and Animals”, only two are on plants (orchids and silverswords) while 14 are on vertebrates. The two on plants bring me back to the Hawaii bias: while silverswords are interesting, and, as Baldwin’s article makes clear, certainly a good example of insular adaptive radiation, does this endemic Hawaiian group really deserve an article to itself when, for example, figs and mangroves do not? I was disappointed that these plants, and the concept of keystone species, got such short shrift.

Having so many contributors must make it hard to achieve coherence. The editors seem to have tried to ensure longer articles are organised in a standard way, by topic, but the flow is hindered by errant entries, such as Cody’s article “Baja California: Offshore Islands”. Most featured archipelagos have maps, but some don’t (e.g. Madeira). The index is useful but not perfect (why separate entries for “fig trees” and “*Ficus*?”), with bold font used (rather inconsistently) to indicate dedicated articles. Another potentially useful feature is the “Encyclopedia website”, proudly proclaimed on p. xxx: “[it] provides a list of articles, the contributors, several sample articles, published reviews...”, with a promise that “The content of the site will evolve with the addition of new information”. So far, this seems to be a wasted resource. At the time of submission of this review (May 2010), nine months after the listed publication date of the book, I can find no list of articles, nothing about the contributors (just three lines on the editors), only one sample article and

just six soundbites of 'review', which appear to have been selected purely for publicity. Personally, I would prefer to see some attempt at balance here; the book is good enough to stand constructive criticism on its website.

Overall, despite its faults, this book contains many fascinating, informative and sometimes insightful articles, which together make both a useful reference and a fine addition to a coffee table. Most readers should, like me, happily spend hours flicking from one article to another, learning something while celebrating the wonderful diversity that is the world's islands. If you are thinking of treating yourself to something a little indulgent, you could do a lot worse than the *Encyclopedia of Islands*.

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thesis abstract

## In search of the forest primeval: data-driven approaches to mapping historic vegetation

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### Introduction

The current biogeographic patterns in a given area are not only the product of contemporary environmental factors, such as climate, topography, and edaphic conditions, but historical factors as well, including anthropogenic disturbance regimes. In North America, for instance, much of the native temperate forest and grassland has been modified in the time since European settlement as a result of intensive human activity (e.g. Forman 1998). Since past human activities can influence biotic patterns for many years (Dupouey et al. 2002), interpretation of biogeographic phenomena without explicit consideration of human influence may lead to erroneous conclusions.

To better understand the influence of these disturbance regimes on ecosystem structure and function, researchers are increasingly using historical data to construct baselines from which subsequent changes in biogeographic patterns can be measured (e.g. Shutler and Hoagland 2004;

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Fritschle 2008). Among the datasets that have been extensively used in such reconstructions are the Public Land Survey (PLS) field notes, witness tree records, and plat maps (i.e. survey map of tracts of land) (Wang 2005). Public Land Survey records provide one of the few quantitative records of pre- and early-European vegetation in much of the western United States. These data have been used to evaluate vegetation dynamics (DeWeese et al. 2007), composition and structure of historical forest and woodland communities (Anderson and Anderson 1975), species-environment interactions (Wang 2007), and distribution and abundance of individual species (Wang & Larsen 2006).

Despite their widespread adoption, PLS data are fraught with limitations, among them bias in tree selection (Bourdo 1956), taxonomic uncertainty (Mladenoff et al. 2002), and the coarse sampling methods employed by surveyors (He et al. 2007). Nonetheless, the data of the PLS