

Book review

THE GREAT BARRIER REEF: BIOLOGY, ENVIRONMENT, AND MANAGEMENT. SECOND EDITION

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This book is a pleasure to read. It covers the iconic Great Barrier Reef of Australia; the world's largest continuous reef system. As such, the reef attracts large numbers of tourists, and a great deal of scientific interest and study. This is reflected in the size of the book, with 488 pages of text and 32 chapters.

Largely because of the importance and fame of the Great Barrier Reef, Australia has become one of the world's leaders in research on coral reefs. Many of the chapters were written by leading scientists. The chapters are very well written, most are easily understood, and they give a thorough coverage of their topics without becoming massive reviews of all the details of the massive literature on this reef system. Such reviews would be impenetrable for anyone who is not already an expert on coral reefs. This book is an education on not only the Great Barrier Reef, but coral reefs in general, as most of what it talks about applies not just to the Great Barrier Reef but also to most coral reefs around the world. So this is not a book that is relevant only to people who have a special interest in the Great Barrier Reef, but to anyone who has an interest in learning more about the world's coral reefs.

Even people who already know a fair bit about reefs in general or the Great Barrier Reef in particular will learn things. For instance, I lived in Australia for 6 years, in Townsville and worked at the Australian Institute of Marine Science, and have been told by more than one Australian who studies coral reefs that the line fishery for coral cod is really the only fishing done on the Great Barrier Reef. That will be quickly dispelled by the chapter on coral reef fisheries. In the chapter on reef fish, I learned that the story with 'herbivorous fish' is much more complicated than it is normally portrayed as. Very good to know that. This book is quite comprehensive, so if you are interested in just one aspect of coral reefs, you will probably find a chapter on your topic.

I could find very few things that I could disagree with, and those were mostly trivial. For instance, at one point it talks about polyp anatomy and refers to its 'gut'. Polyps do not have a gut. They have a 'gastrovascular cavity', so named because it serves digestive, circulatory and hydrostatic skeleton functions. But it is not a tubular 'disassembly line' like a gut. Figure 11.1 shows the decline in coral cover on the Great Barrier Reef since the 1960s. This is a very important point. This appears to be a new analysis, and needs to be explained fully, probably in some other, publicly available peer-reviewed publication, for scientists to check, which needs to be referred to. Also, early in Chapter 12 it says that within 15 years of the beginning of exploitation, most of the world's fisheries were depleted of 80% of their biomass. That is from an older report based on fish catch, which is a weak measure. More recent, better-supported findings in a *Science* paper (Worm *et al.* 2009,

co-authored by experts on both sides of the argument) show that most major fish stocks are not overfished but a fair number are being fished at rates that will produce overfished stocks in the future, and thus the majority have been no more than about 33% depleted (no major fisheries are on coral reefs, and some coral reef fish species are probably depleted more than 80% some places, a few even driven to local extinction, but most coral reef fish species are so small they aren't even fished). In the references for the hard coral chapter, the Hexacorallians of the World website is no longer being maintained, unfortunately and can't be accessed. The content was published in *Zootaxa* in 2016 in open access form, and would have provided an enduring reference (Fautin 2016). The soft coral featured in Chapter 23 omits mention that a fair number of zooxanthellate Alceonacea produce solid platforms underneath them, composed of sclerites that are moved down in the tissue and extruded and cemented together underneath the soft coral. There is a *Sinularia* species that can make sturdy branching skeletons at least 2 m tall, and there are parts of reefs such as in the Swains largely composed of such 'spiculite'. The material produced is about as strong as the skeleton of hard corals. So these soft corals are reef builders or hermatypic, which few realise. Both the fisheries chapter and the echinoderm chapter mention that some sea cucumbers are likely overfished, but there is no mention of any management of them, why? These things account for a few lines in a book 488 pages long. It is hard to find anything in this book that is not technically correct.

Australia and Indonesia are tied for the most coral reef area in the world, and Australia is one of the few developed countries with coral reefs. Further, they are high diversity reefs, with a cornucopia of species of all kinds in the ecosystem, contributing to what it is. We, in the rest of the world, look to Australia to learn more about coral reefs and to see how they can be well managed. This book provides much of what we hunger for. For the most important impacts of humans and future threats, it states clearly and unequivocally what must be done in aspects such as climate change, to save the reef. But even wealthy countries are having a very hard time reducing human impacts on coral reefs. We all must learn from each other how better to manage and save coral reefs, and this book will provide a great education on coral reefs in service of that goal. Each chapter has references that the reader can use to further explore the topics.

This book is a 'must have' for anyone who wants to be well-educated about coral reefs. The time spent reading this book will be enjoyable and well spent, and pay dividends in knowledge about not just the Great Barrier Reef, but the whole world's reefs.

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References

- Worm, B., Hilborn, R., Baum, J. K., *et al.* (2009). Rebuilding global fisheries *Science* **325**, 578–585.
- Fautin, D. G. (2016). Catalog to families, genera, and species of orders of Actiniaria and Corallimorpharia (Cnidaria: Anthozoa). *Zootaxa* **4145**, 1–449. doi:[10.11646/ZOOTAXA.4145.1.1](https://doi.org/10.11646/ZOOTAXA.4145.1.1)