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Biogeographic Atlas of the Southern Ocean. Claude de Broyer and Philippe Koubbi (editors). 2015. Cambridge: Scientific Committee on Antarctic Research, xii + 498 p, illustrated, hardcover. ISBN 978-0-948277-2-3. $80.
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The Census of Marine Life (CoML) was an international decadal research programme posing the simple question of 'how many species were there in the sea?' The question may be simple but the answer was certainly not.

To even start moving towards the CoML goal required an international sampling effort in some of the world's remotest oceans supplemented by an extensive taxonomic and systematic analysis in the laboratories of museums, research institutions and universities. The core of the CoML was the field programmes dedicated to different geographic or ecosystem aspects of the marine environment. The Biogeographic Atlas of the Southern Ocean is a record of the research achieved by the Census of Antarctic Marine Life (CAML). To study biodiversity in the Antarctic was particularly apposite as there is the physical enigma of where the western Antarctic is one of the most rapidly warming marine regions on earth, the eastern Antarctic is staying thermally steady of even decreasing in temperature.

The Biogeographic Atlas of the Southern Ocean is massive. It is printed on just under A3 size art paper and weighs in at 3.4kg! The first quick look through the Atlas and it is apparent that this is a significant repository of information. The text is supported by abundant coloured diagrams of distribution patterns as well as photographs and line drawings of individual species.

Part 1 is an outline of the history of biogeography in the Southern Ocean up to the turn of the century followed by a brief introduction to CAML. Part 2 describes the data collection and mapping. An important aspect of data handing in CoML was standardization of methodology so data could be compared within CAML and was also clear for future users. Immediately we are presented with taxonomic maps for most of the major Antarctic marine taxa which identifies the uneven knowledge of distribution of taxa and regions round the Southern Ocean. Part 3 develops the evolutionary setting together with the palaeoconstruction of the Southern Ocean. Part 4 gives the modern environmental setting including benthic substrata and the distribution of water masses. This chapter is particularly rich in excellent figures that will be hugely beneficial for professionals working in the Southern Ocean and to undergrad and postgrad students with an interest in the region.

Parts 5 to 8 get to the detail of the biogeographic distributions of marine flora and fauna in the Southern Ocean. Part 5 outlines the biogeography of 31 taxa of benthic plants and invertebrates. There are few new descriptions per se as the main aim was to show the distribution of the different taxa throughout the Southern Ocean. Most major taxa are covered although I was a little disappointed that the holothurians and ophiuroids were missing. However, I was pleased to see a section on deep-sea and chemosynthetic environments, the latter only recently discovered in the Southern Ocean. The biogeography of pelagic and sea-ice biota is covered in Part 6, fish in part 7 and birds and mammals in Part 8. All the papers in these four parts are richly illustrated with distribution figures some showing lots of coverage, others very little indicating absence or our continuing poor knowledge.

Part 9 is about changes and conservation in the Southern Ocean. This was an important section and I was not sure why it was before part 10 which took an overview by looking at the pattern and processes in Southern Ocean biogeography. Part 11 is a brief commentary on the Atlas and Part 12 looks to the future for Southern Ocean Biogeography.

And there is no doubt there is a great future in understanding the biogeography of the Southern Ocean. We often think of the Southern Ocean as an isolated region and the increase in resolution of sampling programmes is demonstrating this is a significant reservoir of species. There is also increasing evidence that speciation into the deeper water of the World's oceans arises from the waters surrounding Antarctica. However, this high biodiversity lies under the shadow of the potential impact of climate change and the potential invasion of predatory species at present excluded from Southern Ocean waters by the low temperatures.

This Atlas of the Southern Ocean is a rich source of the most up to date data on biogeography. It is a valuable document for the professional researcher and for the enthusiastic undergrad or postgrad student. Most, I expect, will download pdfs of the separate chapters as the the printed volume in total is very heavy to handle (the report can be accessed online at www.atlas.biodiversity.aq). The editors and the authors should be congratulated on compiling such an authoritative volume that is well written and wonderfully illustrated. CAML, and the Census of Marine Life programme, have proved to be significant drivers in our understanding of marine biodiversity and will stand as significant benchmarks for many years to come (Emeritus Professor Paul Tyler, University of Southampton, NOC, Southampton SO14 3ZH UK (pat8@noc.soton.ac.uk)).