Book review: Toxic and Harmful Microalgae of the World Ocean
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Getting started on understanding harmful algal blooms (HABs) with the burgeoning literature can be daunting. Over the last twenty years a quick survey shows that publications in this field have increased just short of twenty fold per anum. This volume is aimed to be a comprehensive review to make this field accessible, to appeal both to the scientific community and managers. A further stated aim was to explore the question: *is there really a global increase in harmful algal bloom worldwide and are these phenomena significantly related to the marked environmental changes taking place in coastal areas?*

So how do the authors go about such a challenging task? The first chapter sets out the context of harmful algal blooms, interrogating the question posed through exploration of seven reasons the authors identify that might cause an increase or perceived increase in HABs. These reasons include improved awareness, additional
exploitation of coastal areas, eutrophication, unusual climatic conditions, ballast water and shellfish transport, global warming and overfishing. This chapter holds a wealth of historical material and case studies illustrating the different potential causes. The chapter concludes that there is a scientific consensus that HABs have increased but that a more rigorous examination is required. There follows an alphabetical inventory by genus/species including 174 taxa and giving a description of each species, its distribution, its role in regional events and its toxinology/toxicology. The authors have classified species into five categories: non-toxic but high biomass (causing harm through deoxygenation or physical effects); toxin producers associated with food poisoning (gastrointestinal or neurological effects); harmful to fish/marine invertebrates (but no known harm to humans); toxin producers associated with contact effects in humans (aerosols in particular); toxin producers in bioassay but at present no documented effect on humans. The final chapter explores regional case studies with a decadal scale, considers emerging species and seeks to more rigorously interrogate the question posed at the beginning of the book and draw a conclusion. Finally, although this is not designed to be a taxonomic guide, we are treated to 54 plates illustrating key taxa and genera with light and scanning micrographs including some colour plates. The book has text first in English, then after the plates, in French. So what appears a rather weighty volume at first sight, is actually quite compact. At the very end it is completed with a list of species and their toxic effects.

Do the authors meet the challenges they set themselves? I am not sure they answered the question they posed at the outset to their satisfaction. As they indicate, the assertion that HABs are increasing globally, has been extensively
explored and debated. It is easily confounded by the multiplicity of factors that contribute to the complex ecosystems where HABs occur. I think the message this text brings out is that it is impossible to generalise – so on a local scale and considering the local context - trends can be discerned and sometimes explained, but these cannot be generalised at the global scale. Regarding the overarching aim - as a conduit to the field of harmful algal blooms this book is certainly a tour de force in terms of literature coverage. I estimate that just under 1200 references have been included. These cover working group reports, conferences and other examples of grey literature that hold valuable information on species occurrence and behaviour. Importantly there is extensive coverage of older literature that we all have a tendency to overlook in this electronic age. The cut off point for the authors was December 2014 which means that some parts are already feeling dated. Sadly, there is no index so although each chapter is clearly arranged it might be challenging to locate specific information in the narrative chapters should one wish to. However, this book is an excellent ‘go to’ guide to get started on any particular taxon or to harmful algae in general and I would certainly recommend it to students and managers as a jumping off point for their studies.