

ENVIRONMENT

The Algal Bowl: Overfertilization of the World's Freshwaters and Estuaries

By David W. Schindler and John R. Vallentyne. 2008. The University of Alberta Press, Ring House 2, Edmonton, Alberta T6G 2E1. 334 pages. 34.96 CAD, Paper.

Ever wonder about the origin of all that green slime on your favorite swimming beach? Or why laundry and dish detergents are advertised as phosphate free? If so, let Schindler and Vallentyne guide you through the science and politics of eutrophication.

The authors define eutrophication as “the complex sequence of changes initiated by the enrichment of natural waters with plant nutrients.” This is the story of eutrophication by two of the pioneer researchers on the effects of nitrogen and phosphorus enrichment of our freshwaters by human activity. In particular, it was the authors’ long-term, whole-lake experiments at the Experimental Lakes Area in northwest Ontario that ushered in ecosystem-based manipulative experimentation, the results of which proved the key role of elevated phosphorus levels in freshwater eutrophication.

Despite the great advances in policy that control point sources of overfertilization, the authors admit that local governments are still largely unaware of the excellent science available on the causes and effects of eutrophication. This book is their attempt to rectify this situation.

It is well recognized that we live on a human-dominated planet. A major way in which we affect global ecosystems is through our impact on the flux of global element cycling. Many of our environmental issues are a function of enhanced nutrient levels in the environment as a result of human activity; carbon in the case of global warming, sulphur with acid precipitation, and phosphorus and nitrogen in the case of eutrophication of our freshwaters and marine estuaries.

None could be more qualified for this task than the two authors. Both have dedicated their lives to understanding the influence of human activity on freshwaters. Their pioneering large-scale manipulation and monitoring of whole lake systems over long periods of time set a new research standard. Deliberately pol-

luting small pristine boreal lakes with phosphorus, nitrogen and carbon in a well-designed experiment provided the definitive evidence for phosphorus overload as the cause of lake eutrophication – and set the stage for significant policy change. The authors’ work remains a classic example of the power of manipulative ecosystem-level experimentation.

In an imminently readable style, the authors spell out in 14 chapters the history, science and policy of eutrophication. Preliminary scientific chapters on limnology set the foundation for later discussions of the whole-lake experimental process. In between, the reader is introduced to the role of phosphorus and nitrogen as drivers of eutrophication, followed by a history of the detergent phosphate controversy.

Despite the best scientific efforts, the battle against eutrophication is far from won. Eutrophication has assumed ever more complex forms as freshwater and marine estuaries come under increasing pressure from non-point sources of pollution, climate change, and land use changes around lakes and along coastlines. Furthermore, the problem of eutrophication has moved from freshwater lake systems to the so-called “dead” or anoxic zones of our coastal and estuarine ecosystems. While the science of managing eutrophication is quite well known, applying that knowledge to the actual management of water systems is a complex social and political problem.

The authors are to be commended for distilling years of limnological and eutrophication research into one volume. They have presented the science in a readable manner and have proposed policy and management implications of that research. A glossary and eight pages of colour plates add to the text. We have the science. In one sense, that’s easy. Changing our use of water is another issue.

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Antarctic: First Journey

By Geoff Carpentier. 2009. Avocet Nature Services, Ajax, Ontario, Canada. [Contact Geoff – Birds avocet@rogers.com or see www.avocetnatureservices.com] 359 pages. 33.50 CAD Paper.

I have known Geoff for more years than I care to remember. He tells some quirky jokes – groaners really – but he is a great birder. He has written, not a guide to wildlife, but a guide to how to go to this marvellous continent. He covers Antarctica, the Falklands, South Georgia, and the sub-Antarctic and Tierra del Fuego. And yes, his humour comes through.

If you plan to go to Antarctica – and you should – you need to read this book first. It details all the of the prerequisites you need to know to turn this from a trip to an adventure. He begins with the items you should consider before you depart. For example he has a packing checklist that is very close to the one I have developed and used successfully myself for many

years. This is followed by the questions you should ask when choosing a cruise and a ship. He points out the difference in experiences you will have between the smaller expedition ships and the huge cruise liners. One additional item that has bothered me recently is the increasing use of the big liners in ice-laden waters. They are not ice-rated ships and I shudder at the thought of evacuating some thousands of people if an accident happened. My friend was on the MV Explorer when it sank with about 150 people and they were lucky to suffer only a harrowing ordeal.

The author not only covers travellers requirements for staying healthy in extreme cold, motion sickness and similar “normal” problems, but the hazards of penguin poop, snow blindness and Zodiac safety. He goes carefully through a comprehensive list of Antarctic [and actually Arctic] phenomena, especially the fascinating science of ice. Carpentier explains the how and the why of expected tourist behaviour in this region.

There is a chapter on the dominant wildlife in the south. While this is well done, it does not have the depth and breadth a full field guide. The author has also provided a guide to all the important areas and islands in the Antarctic and Sub-Antarctic. Many of these have very interesting histories and Carpentier has really done his homework and this provides an enjoyable read. Finally he summarises the region’s history. This cannot be detailed [Amundsen gets a quarter of a page], but it will give readers an overview and should stir them to read more.

While I would not categorise this as photo book, there are a lot of good photos. These are not always the usual subjects like wildlife and scenery, but some of the more oddball sights like cryoturbated rock or a page in a historic journal. For those of us who have made the trip it is the photos of fuzzy brown penguins

on Salisbury Plain or the yawning Leopard Seal that will be most endearing.

My one complaint is that the book does not have an index. In a book where there are so many individual items of information that I want to check, this is an annoying omission. There are also some materials that are really basic and I wondered why they were included. Are there really adventure tourists who do not know how to find north or to read latitude and longitude or understand wind chill?

Small informational boxes are scattered throughout the text. These contain essential facts, fun, trivia, anecdotes and notable quotes. There are also some scratchy cartoons and a string of the author’s poems. This, along with Carpentier’s writing style, makes the book feel more like a guide to Antarctic trivial pursuit. But do not let this overshadow the book’s value as a valuable resource. It does really contain all you need and all you should know before you go. I would take a good wildlife guide [such as *A complete guide to Antarctic Wildlife* by H. Shirihai, Princeton University Press] and this book on any trip. This would hold if its your first or nth trip. I also think inveterate travellers to anywhere would find many parts of this book useful. Finally a lot of people will find this a fun book to have – so you can confound people with your knowledge of frazil over rime or the non-location of Emerald Isle.

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Reviewer’s addenda:

The author, Carpentier, realising an index was a serious omission, has now provided one. To correct your copy you can now download and print an index at http://www.avocetnatureservices.com/Antarctica_First_Journey.html. The second edition will contain an index.

Biodiversity and Pest Control

By Li Zhengyue, M. A. Altieri, Zhu Youyong. Beijing Science and Technology Press, 16 Xizhimen South Street, Beijing, China, 100035. 2009. 269 pages, 68.00 CNY.

In agro-ecosystems, either as artificial or semi-artificial ecosystems, their biological diversity directly affects the level of sustainable development of agricultural production. Their relationship with pest control has been a concern of ecologists for a long time. The species diversity in agricultural insect communities is based on the multi-level food chains and food webs linked by nutrition. With the intensification of modern agricultural management, the structure of agricultural landscapes and the biodiversity of agro-ecosystem become simplified, resulting in the failure of natural pest control in many countries or areas. Simple biological diversity of agro-ecosystem caused instability of the relationships among crops, pests and natural enemies, lead to the outbreaks of pests becom-

ing more and more serious. FAO estimated that grain and cotton production loss 14% and 16% respectively each year due to the damage of pests in the world. China losses billions of dollars annually due to agricultural pests. In the past, simple chemical pesticides were widely used to control pest populations, as do many areas even nowadays. In China, the control of agricultural pests mainly relied on chemical pesticides for many years, consuming large amount of pesticides. According to the statistics, only the active ingredient in the chemicals annually produced is more than 200 000 t in China. Wide application of chemical pesticides inevitably leads to serious environmental problems, such as so called “3R-problem” (resistance, resurgence and residue). In order to manage agricul-