

BOOK REVIEWS

Earth Systems: Processes and Issues

EDITED BY W. G. ERNST

× + 566 pp., 28 × 21.5 × 3.5 cm, ISBN 0 521 47895 2 paperback, GB£ 27.95, US\$ 44.95, Cambridge, United Kingdom: Cambridge University Press, 2000

This book, as the Editor rightly points out, is an interdisciplinary perspective on the fundamentals of physical, natural and social sciences as they relate to the global environment. Comprising 33 chapters over 566 pages, it covers the complex relationships linking the geosphere, biosphere, hydrosphere and the atmosphere and the impacts of societal and policy decision-making on those natural processes. The Editor attempts to be quite ambitious in the book's coverage of these issues at the global scale and generally succeeds. However, a large number of authors have contributed and all are from North America, with most of them being from Stanford University, where the Editor is currently a professor in the Department of Geological and Environmental Sciences. This means that some of the chapters on domestic policy and resource allocation issues are a bit USA-centred. However, this does not detract from the fact that issues are reviewed fairly comprehensively in a style which is easy to read and understand. The book avoids going into the mathematics of the systems described and contains virtually no equations. For this reason, it is an ideal introductory text for students and new researchers in environmental science and policy. Particularly useful throughout is the use of shaded text boxes describing case studies and/or additional notes in support of the chapter material. A further reading list and a number of questions to challenge the reader to discover more on the subject follow each chapter. However, the material presented is not referenced and there is no general bibliography included. There is a detailed glossary and several useful indexes, including ones for locating key topics by geography and significant events as well as the usual and comprehensive general index. Throughout, the authors have made good use of explanatory figures and photographs, which are in monochrome, and there is a small selection of colour plates provided. Over the short time I have had to review this book, I found it a very useful information source and I would definitely recommend it to my colleagues as well as students.

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The Land that Could Be: Environmentalism and Democracy in the Twenty-First Century

WILLIAM A. SHUTKIN

×× + 273 pp., 23.3 × 15.7 × 1.9 cm, ISBN 0 262 19435 X clothbound, GB£ 17.50, Cambridge, USA and London, UK: MIT Press, 2000

The environmental movement in the USA has been criticized for being elitist and out of touch with the body politic, despite the fact that survey after survey confirms broad support among Americans for environmental policies. Shutkin had this apparent dilemma foremost in mind while writing this book. He presents himself as an environmentalist who works outside the oligarchical and huge environmental-interest groups based in Washington DC. His affinity is for the people who normally bear the risks and pay the costs of the environmental consequences associated with unmanaged land development and the pollution fall-out from the 'risk society'. Shutkin is motivated by a desire to achieve environmental justice and to engender a healthy and authentic local civic culture.

Driven by a desire to defend human dignity against the crushes of a post-modern risk society, Shutkin has his sights on a remedy that is holistic and more permanent than a mere legal settlement of economic compensation. The solution this book helps advance is a union of two important social movements: the environmental movement and the social justice movement. Dismissing white upper-middle class environmentalists who want to preserve wilderness devoid of human inhabitation, Shutkin advances an environmental cause aimed at creating peopled environments, be they urban, suburban, or rural, that are healthy for human beings, constructive for community, and sustainable as natural ecosystems. At the same time he reminds social justice advocates that the solution to human injustice must be a reinvention of a healthy civic culture in every neighbourhood and place. Moreover, to make these changes plausible in a capitalist economy, they must come hand-in-hand with sustainable economic development. Thus, he lauds interventions when they 'do not make distinctions between environmental, social, and economic goals. Instead, they are viewed as inextricably linked' (p. 231).

Civic environmentalism is the term Shutkin uses to label activism that successfully integrates social justice goals with environmental protection goals. To the book's credit, this term is actually defined as comprising six elements, namely participatory process, community planning, environmental education, industrial ecology, environmental justice, and sense of place. Conceptually, one of this text's prime accomplishments is in drawing the lines of connection that link these different disciplines into a coherent meaning. Most

readers of this book will be quite familiar with two or three of these areas, and will benefit from Shutkin's explanation of how they can all be merged into a way of seeing the world that, combined with activism, actually has a good chance of creating sustainable communities.

The organization of the book is sound. The first two chapters make the links between civic life and environmental conditions. Scholars will appreciate chapter three, which comprises 53 pages of conceptual discussion about the meaning of civic environmentalism. This is an important contribution because it synthesizes a number of concepts into a coherent depiction of how sustainable community development can come about. Following this are four chapters documenting actual cases which Shutkin believes are civic environmentalism in practice. Although I often find such case studies a disappointment, this was not true here. Shutkin is not a terrifically engaging writer, but the case study chapters hold the reader's attention and convey useful and relevant information efficiently. I read every case thoroughly, enjoyed them, and felt I learned a lot, especially when I was able to compare the cases against each other. The communities are aptly chosen and are diverse, stretching across the country from east to west, covering urban, suburban, and rural communities. But the best thing about the cases is that they depict how democracy and environmental ethics can come together in unique ways that are reflective of a community's identity. They illustrate that locally-driven change is authentic to local identity and culture, reminding us that real sustainable development cannot be imposed on communities by the state.

Attention to the level of local communities is this book's strongest and weakest attribute. Strong because it reminds us to not forget the individuals who bear the externalized costs of development and industrial production, and it reminds us that in a democracy the people are sovereign, not the corporations, not the huge environmental and industrial lobbying groups, not planners or elected representatives. Definitions of what is good and just must come from the citizenry. At the same time, Shutkin's attention to the importance of the local level has led him to underappreciate the effects of liberalism and globalization. He is unrealistically enthusiastic about the ability of local communities to realize self-determination in the face of leviathans like Microsoft, the World Trade Organization, and the Government of the USA. Indeed, several of the case studies illustrate this point. The Oakland California case revealed how incredibly powerful the Bay Area Regional Transportation Authority (BART) was in determining what happened to the downtown Fruitdale neighbourhood. At the same time the people in Roxbury, Massachusetts were stymied by the Massachusetts Superfund laws. Local culture at the moment can only survive in the interstices that higher orders of governmental regimes have not yet colonized. Wrestling power away to local communities is an issue Shutkin does not address.

This is clearly an American text. It is rooted in American literature about democracy and planning, all the cases are

from American locales. European and other audiences may find the book is insufficiently aware of the differences in democracy, and particularly in planning practice in countries that worship the concept of a free market less. Still, the book does advance our thinking about how sustainable community development might take place. And it offers a way to unite social movements to promote local self realization of the sustainable community.

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Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience

EDITED BY FIKRET BERKES AND CARL FOLKE

xvi + 436 pp., 22.6 x 15.3 x 3.0 cm, ISBN 0 521 78562 6 paperback, GB£ 19.95, Cambridge, UK: Cambridge University Press, 2000

We need more interdisciplinary books like this one. Fikret Berkes and Carl Folke are two of the world authorities leading the resurgence of interest in studying enduring social-ecological systems. In this volume, they bring together a group of interdisciplinary experts, for example from ecological economics, systems theory, ecology, anthropology, human geography, and institutional analysis to name a few, for a diverse but generally well-integrated case study treatment describing linked social and ecological contexts and their resource management systems.

This book enters the realm of what I consider to be really useful 'transdisciplinarity', where connectivity of nature, humanity and its institutions is recognized and dealt within an holistic way. Strict reductionists might not like this; it may seem 'airy-fairy' to some, but, as epitomized in this book, I think it is practical and critically important for shifting ecosystem management up a gear into a new realm integrated with social and institutional science. This subject area and the communication of it have real potential to influence policy, institute on-ground action, and lead us towards a more cohesive and sustainable future.

The Editors state the objective for the book is to understand 'how the management of ecological systems can be improved by learning from a variety of management systems and their dynamics'. I can think of many books with a similar focus, but there are very few with the very interesting (and relevant) emphasis on the social systems and mechanisms for ecosystem management. It seems to me that the aim of Berkes and Folke is to distil the 'common ground', the elements or principles that seem to be present in successfully enduring human-ecological systems.

As a whole, the volume contains the works of 23 distinguished authors in 16 chapters, organized into four major

sections. An introductory chapter sets the scene and context for the following sections and chapters, which are primarily case studies. Part I (three chapters) contains descriptions of social systems for resource management that have been locally devised. Part II (four chapters) describes the recent evolution of several adaptive learning systems elucidating some of the dynamic processes involved. Part III examines various lessons from regional-scale local systems, and includes generalizations derived from the literature on several global regions. Some design aspects for social-ecological resource management institutions are dealt with in Part IV (four chapters). The final chapter synthesises many of the lessons from the case studies. It suggests some important social features and ecological elements of context and management that appear to be characteristics of successful social-ecological systems. These are similar to and build on the studies of Elinor Ostrom (principles of self-governing common property systems), and the work of Margaret McKean on the ecological context and nesting of social systems and institutions for common property resource management.

The readership for this volume is potentially very broad and the book will be useful for students and academics across many disciplines as well as resource management professionals and policy makers. Overall, this volume provides an excellent and timely synthesis of case studies. The lessons and principles synthesized are a tremendously valuable contribution to the study of policy, institutional, community, and indeed, 'on-ground' natural resource systems. Of particular value are the linkages made between ecological management practice and, the social and institutional mechanisms behind them. Highly recommended.

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Ecological Data: Design, Management and Processing

EDITED BY WILLIAM K. MICHENER AND JAMES W. BRUNT
 xi + 180 pp., 23.4 × 15.7 × 1.1 cm, ISBN 0 632 05231 7
 paperback, GB£ 32.50, Oxford, UK: Blackwell Science Ltd, 2000

This short, well-presented volume is one of the most recent additions to the 'Methods in Ecology' series. A group of authors have produced a set of chapters to deal with the previously neglected topic of ecological data management. Chapter one by Michener provides a useful, but general, review of research design. This chapter sets the scene for subsequent chapters and provides an extensive list of references.

The second chapter by Brunt is on data management principles, implementation and administration. It has as its

mantra 'start small, keep it simple and be flexible'. Unfortunately, this is easier said than done and there is little useful information here to inform a novice data manager of how to succeed. The brief outline of the data management process is useful, but sections on data design assume the use of relational database management systems when the more general concepts of database management systems (DBMS) have not yet been explained. Likewise file systems lack proper introduction, although their successful use is very important. Fortunately, other chapters ameliorate the problems here.

John Porter's chapter on 'Scientific databases' is the most useful section of the book. An interesting introductory section makes the reader think about the differences between data describing diverse environmental (and business) phenomena. The dynamic nature of database development is pointed out and four key questions for all database designers are posed. Why is the database needed? Who will be the user of the database? What types of question should the database be able to answer? What incentives will be available to data providers? The section on data modelling would have been better placed before an introduction to DBMS, as this is one of the important first stages to efficient data management. Although Porter does not state what the hallmark functions of a DBMS are, he does describe the most commonly used types of DBMS and accurately considers the public domain versus commercial software question.

The fourth chapter on data quality assurance by Don Edwards begins by considering data contamination by data entry error. This discussion could have been extended, perhaps by shortening the next section dealing with outliers in the statistical analysis of data. This discussion provides information that can easily be obtained from many introductory statistics books; books that cannot be replaced by this slim volume. The statistical packages SAS and S-Plus are mentioned as useful tools, but a host of other alternatives exist. Bibliographic details for these tools and methods could have been expanded to give readers a choice of options for further study.

The next chapter, again by Michener, is on metadata; data that fully describe the provenance, format, quality, and other attributes of data sets. The scope of this chapter is just right. It deals with one data management issue in full. The important role of metadata in ensuring ecological data are of use to new users is clearly stated. Metadata standards for spatial data are well introduced and proposals are made for what might become good practice in dealing with metadata for ecological data sets.

Chapter six by Richard Olson and Raymond McCord is about archiving data. It introduces the concept of an archive and also discusses some existing data archives holding large environmental data sets. The archives listed provide a good starting point for those beginning a search for environmental data. Some useful tips are given on preparing data for archive, but many of these are also important for the initial

creation of databases and could have been given in chapters on data modelling or DBMS. One particularly useful warning given is to avoid being tied into proprietary software data formats.

The final two chapters are also by Michener. The first, on transforming data into information and knowledge, relies too heavily on detailing traditional statistical techniques. These only needed to be described very briefly, including a list of reference where the interested reader can find out more. If these sections had been cut out, the sections on data mining and data warehousing could have been expanded. Data mining is likely to be of particular interest to ecologists in the near future. Michener's final chapter provides a 'utopian' view of future data accessibility and discusses how steps towards this can be achieved. It provides a competent drawing together of many of the topics discussed.

The aim of this publication is to help ecologists manage data and information more appropriately. This arises from the authors' appreciation of two developments in the study of ecology. The first is how ecological work has been changing from 'the plot to biome scale' which means that researchers must handle secondary data sets, often obtained from other research projects. Data can no longer be seen as 'consumables' for the purposes of one research publication, but should be viewed as potential resources for the future research efforts of ecologists. The second rapid development has been in technology. These developments have led to a fantastic increase in the volume of data available to the ecologist. However, increased volumes of data lead to increasing data management problems. This publication is therefore entirely appropriate and extremely timely in its release to the ecology community. Sadly, the subject matter deserves more detailed discussion than this publication affords. Data modelling and DBMS could have been given their own chapters, just as metadata and archiving were. However, these authors have made a start and throughout the book they have bravely raised the funding issues involved in database creation and data access. They point out that creating a good database is certainly as difficult as producing a publication, and yet the research community allows little prestige for providing soundly managed data.

The suggested readership consists of those involved with environmental databases and more broadly scientists and students in the ecological and environmental sciences. However the book's content is of most use to graduate level students starting out on their research careers. Indeed, parts of the book could form useful reading for research methods courses at the Masters and PhD level. Those already involved with environmental databases should be only too aware of the issues discussed.

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Pandora's Poison, Chlorine, Health, and a New Environmental Strategy

BY JOE THORNTON

xii+599 pp., 16 figs., 22 tabs., 23 × 16 × 4 cm, ISBN 0 262 20124 0 hardcover, US\$ 34.95, Cambridge, MA, USA: MIT Press, 2000

Poisonous green fumes threaten the earth on the cover of *Pandora's Poison*. With this book Thornton has produced an impressive and comprehensive volume on the environmental issues related to chlorine. The majority of his book (around 500 pp.) contains facts, figures and discussions on the chlorine industry, the compounds it produces and the environmental damage they cause, but the author takes his audience one step further. Thornton uses chlorine as a case which exemplifies the need for a 'new model for environmental policy', namely the 'ecological paradigm'. The book is intended to be accessible for any literate person yet informative for specialists in the environmental field and fulfils this promise. Citations, calculations and more specific discussions are avoided in the main text and conveniently situated in more than 50 pages of endnotes. With almost 70 pages of citations to scientific literature, this book is an important starting point for all interested in environmental issues related to chlorine. In the preface Thornton is quite explicit about the fact that he selected information that he believed to be the most important and relevant to the case that he is making and claims neither objectivity nor balance. In some phrases Thornton can still be recognized as a former research coordinator for Greenpeace. However, the information that is presented in the book is presented clearly, transparently and scientifically and can easily be traced back to scientific literature.

The main argument of the author is presented in the Introduction (19 pages) and reads like an abstract. The Introduction is followed by an in-depth discussion divided into three parts, namely The Problem, The Cause and The Solution. In the first part, the environmental problems related to chlorine are discussed, in the second part the focus is on the chlorine industry, and in the third part the ecological paradigm is defined and defended.

The argument Thornton makes is that the use of chlorinated compounds in industry and consumer products poses a serious threat to both the environment and human health and that the 'risk paradigm', which governs current environmental policies, is ill-suited to cope with this threat. According to the author, the ecological paradigm needs to be introduced to cope with this and other similar threats. The major flaw in the risk paradigm, the author argues, is that the underlying assumption is that 'some acceptable amount of chemically-induced risks must inevitably be taken in the course of economic production'. For substances which are persistent (like dioxins) and for effects for which there is no clear threshold (like carcinogenicity) this assumption does not apply, according to Thornton. However, the most important problem of the risk paradigm which is discussed in his book is that it provokes a focus on individual compounds and indi-

vidual dischargers and thereby offers no opportunity to address the total pollution burden.

With *Pandora's Poison* Thornton presents a compelling case for a 'chlorine sunset'. In chapter nine of the book the author steps beyond chlorine and states that the acceptance of his ecological paradigm would be 'a statement by society that the majority of synthetic organic chemicals should be gradually phased out'. The continuous path towards cleaner production that the ecological paradigm should stimulate, according to Thornton, is something that most politicians and industrialists will subscribe to. They will even argue that this process started years ago. However, in order to even think about a phase-out of the majority of synthetic chemicals we need to rethink completely the structure of modern economies. After all, it would be hard to imagine sellotape and text-markers, let alone computers and television, in a world without synthetic chemicals. It is therefore not surprising that almost all the alternatives for applications of chlorine that Thornton mentions are dependent on the use of other synthetic chemicals. Thus, although Thornton clearly illustrates the flaws of the risk paradigm and his ecological paradigm has some important advantages, it is not obvious from the text that the latter would be a viable alternative.

Pandora's Poison is a must for anybody interested in the environmental debate on chlorine and an interesting title for those who are interested in environmental issues in general. Although the subject itself can be tough, Thornton writes about it in a very accessible style which makes the book both informative and fun to read.

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Explaining Environmentalism. In Search of a New Social Movement

BY PHILIP W. SUTTON

x + 238 pp., 5 figs., 21.9 × 15.3 × 1.9 cm, ISBN 0 7546 1312 7
hardback, GB£ 40.00, Aldershot, UK: Ashgate Publishing Ltd, 2000

The aim of Philip Sutton's book is to situate recent environmental movements in a historical context. The book begins with a description of the division of environmental movements into two orientations which Philip Sutton dubs 'environmentalism' and 'radical ecology'. The following two chapters discuss interpretations that various authors have given to environmental movements; this also includes a critical review and stock-taking of the concept of 'new social movement'. The next two chapters give an overview of the

development of environmentalist thinking, first over a longer time span, extending back to the 19th century, then during the last few decades. Then follows a discussion of the relationship between industrialization and environmentalism, and the book ends with a synthetic chapter entitled 'Towards a socio-historical explanation of British environmentalism'.

This outline of the contents seems straightforward, but in reality the argument developed in the book lacks clear focus. In fact, the reader has to work hard to get an idea about what Sutton's book is all about. This is for two main reasons. First, the opening of the book fails to set the stage for a coherent argument: Sutton nowhere tells us how his quite conventional description of the two streams of environmental thought in the opening chapter serve the aims of the book. In fact, the reader gets confused as to what precisely is the 'environmentalism' Sutton wants to explain. Second, the argument of the book has primarily, even overwhelmingly, the character of a commentary on other authors' texts. In very few instances in the historical sections does Sutton build upon original data not available elsewhere.

Sutton's basic intention seems to be to show that first, environmentalism is not such a new phenomenon after all, and second, that the term 'new social movement' adopted by several social analysts in the 1970s and 1980s is not fitting because it collapses together movements that differ greatly from each other and, furthermore, these movements had precedents already in the past century. This aim is stated, for the first time as far as I noticed, in a footnote to the fifth chapter of the book, on p. 159.

Sutton gives some interesting material to support these assertions, but in a way this increases the confusion of the reader: if, in fact, 'environmentalism' is not a well-defined phenomenon, then what does 'Explaining environmentalism' mean; and if there are no new social movements, then what does the subtitle of the book, 'in search of a new social movement', mean?

In the last chapter Sutton tries to summarize his aims. In the last paragraph of the book he writes: 'My general intention has been . . . to show that a social process perspective which takes the longer-term seriously in relation to social movements, can highlight some of the lines of continuity and direction of development which are easily missed in theories which concentrate attention only on contemporary manifestations'.

This sounds reasonable, although the sentence is almost unreadable. Had Sutton started off with this thesis, and organized the argument to pursue the idea further, the book would be useful. However, as a conclusion preceded by 210 pages of text, the thesis tends to come across as vacuous. Consequently, the book tends to come across as vacuous, too.

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Towards Sustainable Consumption: A European Perspective

EDITED BY BRIAN HEAP AND JENNIFER KENT

vi + 157 pp., 24.5 × 17.2 × 7.0 cm, ISBN 0 854 03537 0
paperback, GB£ 19.95, London, UK: The Royal Society, 2000

Environment, population and consumption are three problem areas highlighted in discussions of sustainable development. This book places consumption at the centre of sustainable development and provides the reader with an overview of the steps being taken in Europe to achieve sustainable patterns of consumption.

Towards Sustainable Consumption: A European Perspective comprises 17 papers contributed to an Inter Academy Panel conference entitled *Transition to Sustainability*. In the Foreword, Sir Aaron Klug pre-empted the book's commitment to facilitating policy-relevant, interdisciplinary science, while Professor Brian Heap's introduction highlights some of the drivers of consumption and the general perspectives offered by various disciplines.

Each chapter of the book is written in an accessible style and delivers an over-arching perspective on the respective topic areas, including energy, biodiversity, water quality, land use, fisheries, agriculture, technology, environmental policy, trade, and legal and social issues. These domains reflect a number of disciplinary contributions, including biology, chemistry, economics, law, philosophy, political science, and psychology. There is also an appendix containing a list of web addresses for government and non-government publications. The volume is likely to be of interest to environmental researchers, policy-makers, and post-graduate students who recognize the inherent interdisciplinary nature of the connection between unsustainable consumption patterns and environmental degradation.

This book is laudable for a number of reasons. For example, it is comprehensive in scope, easy to read, and takes seriously the relationship between science and society. But, perhaps its greatest strength is its contribution toward an interdisciplinary understanding of consumption at a variety of temporal and spatial scales, and levels of analysis. Bringing together the social and natural sciences is recognized as a necessity in environmental research generally, where both the human and the biophysical systems interact in significant ways (Machlis *et al.* 1997; Redman 1999). It is also likely to prove a difficult enterprise (Heberlein 1988), but one that provides opportunities for changing the way questions about sustainable consumption are conceived and studied in each of the sciences. Realizing this goal should entail an appreciation of the diverse philosophies of knowledge co-existing within social science disciplines. Otherwise, potentially fruitful approaches might be ignored simply because their methods do not fit easily with the natural sciences' emphasis on quantitative measurement and experimentation.

Toward Sustainable Consumption is well presented, although all the diagrams are printed in black-and-white save one full-colour chart, and there is the occasional referencing

error. Curiously, the volume is printed on glossy paper, having a low recycled component. Nevertheless, this book successfully provides a basis for scientists to develop an interdisciplinary language about sustainable consumption, and see more clearly where their own disciplinary bound models and theories are positioned relative to other viewpoints in the socio-political context.

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Making Important Environmental Decisions. An Alternative to Risk Assessment

BY MARY O'BRIAN

xviii + 286 pp., 22.7 × 15.0 × 2.0 cm, ISBN 0 262 65053
paperback, GB£ 15.50, London, UK: The MIT Press, 2000

This book is concerned with the uncertainty within uncertainty and the risk in risk assessment. It is a very timely book since all resource managers and applied scientists will be aware of how prominently risk, hazard, uncertainty and safety feature in the current scientific and science policy agendas. Mary O'Brien is, I suppose, reminding us that the public's perceptions of science as 'certainty and fact' was never a correct perception. Science is about testing and disapproving hypotheses. Laws only exist until science identifies situations in which that law is no longer applicable.

Of course this is not an earth-shattering book; few can achieve that status. It is, however, an extremely valuable contribution made by a risk assessment specialist to the science, or perhaps we should say art, of making environmental decisions in circumstances that involve risk. The book is somewhat evangelical in tone as often happens, we are led to understand, in the case of converts. In this case, Mary O'Brien has a substantial professional career history of conducting risk assessments, and has written this book largely through case studies and demonstrations to show the ways in which risk assessment can fail, can be ignored, or can be abused.

The book is in three parts. The first part considers what is wrong with risk assessment. It explains why risk assessment has been so readily accepted by policy makers and scientists. It shows how risk assessment is conducted in practice and highlights the areas of failure. In writing this, I take the view that Mary O'Brien is not emphasizing that risk assessment fails, but more that its use can be abused for political and business ends. The second section of the book considers a technique called 'alternatives assessment', which is a very simple concept; it means simply looking at the pros and cons of a broad range of options. In that respect we might imagine it is no different from cost benefit analysis, but Mary O'Brien is at pains (a whole chapter of pains) to emphasize that the monetary emphasis of cost benefit analysis is often not helpful in environmental decisions. Her alternatives assessment is much more closely related to participatory analysis so widely used, particularly in rural and development decision making. This section of the book then argues that alternatives assessment is simple, that we already know how to do alternatives assessments and indeed we already know how to encourage the use of alternatives assessment in decision making. The third section of the book is much smaller than the first two parts. It covers less than 10% of the text and simply considers how the shift from current reliance on risk assessments and comparative risk assessments to assessments of alternatives can be made.

This is a book worth reading, but it is not a book without faults. Alternatives assessment, when it is detailed in chapter 13, appears to be rather similar to the public enquiry process in the United Kingdom or a participatory rural analysis process in developed countries. It probably should be acknowledged more forcefully that the outcomes will depend on the relative political strength of the various 'publics' that are incorporated into the decision making process. Mary O'Brien perhaps needs to question more why benefit cost analysis, risk assessment, comparative risk assessment, benefit risk assessment, input output analysis, environmental impact analysis, environmental auditing and other procedures have been developed. In my view they have been developed because the simple listing of pros and cons omits major questions on the relative importance of each of those advantages and disadvantages. In many ways, trying to find a numerical expression has occurred because of the disputes that inevitably arise when all aspects of all alternatives are presented.

I was pleased to read this book and enjoyed reading it. The many case studies or summaries of case studies will be a very valuable teaching tool. My only concern might be the extent to which I am reading a somewhat partial, if not biased, presentation of the case study.

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Cetacean Societies: Field Studies of Dolphins and Whales

EDITED BY JANET MANN, RICHARD C. CONNOR, PETER L. TYACK AND HAL WHITEHEAD

xiv + 434 pp., 28 × 21.4 × 2.5 cm, ISBN 0 226 50341 0 paperback, US\$ 35.00, GB£ 24.50, Chicago, USA: The University of Chicago Press, 2000

Cetacean Societies is the culmination of an ambitious undertaking to provide a 'landmark volume' in cetacean studies. It provides a comprehensive review of the current state of knowledge, with a 'value-added' component in the form of signposts to the future direction that cetacean research should take. Its intended audience is similarly ambitious, namely 'students of cetology', non-cetologists working in behavioural and conservation ecology and 'anyone with a serious interest in the world of whales and dolphins'. The book achieves its aims with some style. Whilst providing an invaluable and novel synthesis of what is currently known of the lives of these animals, the text also consistently puts cetacean studies into context by comparisons with work on other better-known species.

The editors compare their book with key publications on primates, particularly the important texts of Devore (1965) and Smuts *et al.* (1987). They conclude that *Cetacean Societies* shows that cetacean studies have to date only brought us close to the level of knowledge that was achieved for primates by 1965. One of their aspirations for the text is to help generate research that, 20 years further down the road, will bring cetacean studies on par with those on primates. My evaluation is that they have produced a book that will indeed make an important contribution to achieving this target.

Cetacean Societies starts with a fascinating, and sometimes controversial, insight into the history of cetacean research. It then proceeds to look at four species in detail, namely the bottlenose dolphin, the orca, the sperm whale and the humpback whale. Readers are then treated to a section on comparative studies, theory and conservation before the text is brought to a conclusion with the editors' views on the future of cetacean behavioural research. There are also helpful annexes on phylogeny and taxonomy and a useful citation index. Each chapter is written by experts in the field who provide comprehensive and stimulating accounts. Highlights for me include the sections on the curious society of sperm whales, the difficulties involved in whale population estimation, and the very helpful guidance provided by Janet Mann in her chapter on modern field methodologies.

Many of the conclusions of the contributors are fascinating and significant. For example, in the epilogue, the editors recall that the cetacean biologist, David Gaskin in 1982 felt able to conclude that 'statements that assume the existence of a high order of social evolution in the Cetacea are, frankly, not supported to any extent by the observations of free ranging populations' (Gaskin 1982). Tyack, Connor, Mann and Whitehead now comment 'Fifteen years later, the

results summarized in this book [*Cetacean Societies*] justify a radically contrary conclusion: cetaceans are among the most socially diverse and complex orders of mammals. And research on cetacean societies is in its infancy compared with that on primates, carnivores, or ungulates.'

The quibbles that I have with *Cetacean Societies* are few. As a large and dense text covering a range of diverse technical issues, including marine acoustics and the application of modern genetic techniques, I feel it would benefit from a glossary. In their consideration of environmental threats to cetaceans the relevant authors note that they have been 'cautious'. Too cautious I would suggest. For example, I believe that their virtual dismissal of possible consequences for cetaceans of lower levels of detectable pollutants might be usefully reconsidered in the next edition. I also have some reservations about the interpretation made about the value placed on captive studies for the investigation of cetacean behaviour in the section on the history of cetacean research. The authors of this particular chapter appropriately report a debate on this topic but align themselves with those who see the current lack of aquarium-based studies of cetacean social behaviour as an 'unfortunate' lapse. Whilst their perspective on the history of captive studies is very interesting, the issue is fundamentally an ethical one and our growing appreciation of the social nature of cetaceans would seem to further tip the balance of the debate against the advocates of captive studies. The book would have benefited from a neutral review, and I hope that the debate which may be prompted on this issue will not act to obscure the value of the rest of the book.

The book is handsome and well organized. Great care has been given to producing well designed figures and tables that contribute to the understanding of the written text and thought-provoking black-and-white and colour pictures further enliven the commentary. I believe that the text has the potential to give the stimulus to future cetacean studies that its editors and authors intend. It is an excellent account of the state of research into cetacean behaviour, but also provides an insight into our present relationships with these animals. My own interests range from cetacean field studies to the development of conservation strategies and protective legislation, and I have already found *Cetacean Societies* invaluable. I am sure that this book is going to remain close to my workstation for many years. Without endorsing all of the opinions expressed in the book, I strongly commend *Cetacean Societies* to anyone 'with a serious interest' in whales and dolphins.

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Commercial Fishing: the Wider Ecological Impacts

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v + 66 pp., 23.0 × 21.0 × 0.5 cm, paperback, ISBN 0 632 05608 8
 paperback, GB£ 9.99, London, UK, Blackwell Science, 2000

This book is useful for students in both further and higher education. In accordance with its aims, the book presents a good overview of the wider ecological impacts of commercial fishing, offering a concise reference tool and a starting point for further research for students studying for environmental, biological and resource management courses with an interest in fisheries. The authors take each of the major issues on a point-by-point basis, drawing out the key points in the margin and providing a summary paragraph at the end of each chapter. With typeface and layout that are easy to read, and the use of figures and photographs, the text is easy to assimilate. There is no referencing of source material within the main body of the text. However, a list of 45 reports, books and journal articles is provided as suggested further reading.

The first few chapters present an overview of the ecological impacts, address the mode of operation of different gears and the effect they have on different bed types and biological assemblages. The authors then turn to consider the various impacts in more depth, notably the impacts of litter generated by fishing gear, modifications to habitats and ecosystems resulting from fishing activities, and the direct and indirect effects of fishing on non-target organisms. Topical issues such as net-associated mortality and discards are discussed alongside other, less high-profile yet serious, issues, such as the damage caused to coral reefs and seagrass meadows by certain fishing methods.

The final chapters turn to the management of the ecological impacts of commercial fishing. Firstly, the mechanisms available for monitoring the effects of fishing activities are discussed, and secondly, some of the management tools being used and available for the conservation of impacted habitats and species are reviewed.

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