for handling cell biology images that I had been taught by other image analysts are documented here. Golden rules that conclude each chapter provide great summaries that make it easier to use the book as a reference. Additionally, the supplied code examples are excellent starting points for building components of custom image analysis pipelines and workflows using the ImageJ macro language and R. This volume should be particularly commended for the comprehensive foundation it builds. The discussion of computational tools and methods span from graphical tools to Linux command line utilities with an emphasis on Fiji and R for the key image analysis and statistical processing. As a consequence, readers are provided knowledge of a suite of open source and freely available tools that they will be able to use regardless of their level of support. Throughout the book, high-level imaging and image analysis concepts are also discussed. Along this thread, Royle begins with image acquisition and follows the lifetime of image data through analysis and figure generation, all the way to data storage and preservation. A thorough reader of *The Digital Cell* will be advised about the concerns and challenges of image analysis, will be familiar with key tools for addressing these challenges, and will be ready to handle the growing field of image analysis within cell biology.

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CONSERVATION BIOLOGY

PREDICTING FUTURE OCEANS: SUSTAINABILITY OF OCEAN AND HUMAN SYSTEMS AMIDST GLOBAL ENVIRONMENTAL CHANGE.

Edited by Andrés M. Cisneros-Montemayor, William W. L. Cheung, and Yoshitaka Ota. Amsterdam (The Netherlands) and New York: Elsevier. $127.50 (paper). xxvii + 554 p.; ill.; index. ISBN: 978-0-12-817945-1. 2019.

This valuable book examines the changing ocean in the context of both environment and human society with the goal of framing how coastal and marine systems can survive. Many of us in the ocean conservation community have been saying we need to change the human relationship with the ocean for greater sustainability. This volume frames one path forward in 49 well-researched chapters by 73 interdisciplinary contributors.

The book focuses on biophysical changes, how they relate to human activities, and what challenges there will be for ocean governance. Global aware-

ness of the ocean's life support role has been rapidly increasing, as has the understanding of the scale of anthropogenic harm to ocean systems. To predict the future ocean, this volume was developed around four basic components: "(1) characterizing the coupled human-nature marine system, (2) exploring the confidence and uncertainty in the future ocean projections, (3) examining adaptation to the changing ocean, and (4) elucidating the linkages between the ocean and sustainable development" (p. 6).

The complex and conflicting interactions in ocean systems lead to a very high degree of uncertainty and heterogeneity in making predictions about the future. What happens in one geography may not be replicated or even replicable in another. All can agree that the four most expected aspects of biophysical change—sea temperature rise, acidification, deoxygenation, and shifting of primary productivity—will lead to significant ecological changes. These ecological trends are intertwined with human activities. Anticipated or not, they will result in human adaptation. These are familiar themes. What is useful is this book's attempt to make the leap to predictions that take these biophysical changes, adaptation by humans, and a myriad of other factors into account in order to "see" how to get to the best possible future.

Rather than predict doom, the volume strives to define a better relationship between human societies and the ocean, based on sustainability and equity. The challenge will be to redesign ocean governance for true sustainability at subnational, national, intergovernmental, and regional, as well as international levels—in the context of unprecedented and unpredictable global change in ocean systems. Meeting these challenges will require changes of similar magnitude in governance including substantially increased accountability, transparency, and equity in the distribution of costs and benefits to be legitimate and successful. Such equity, and thus sustainability, must be intergenerational, local, and global—and this well-designed and well-written book helps us understand how we got here and where we can go.

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MULTISPECIES AND WATERSHED APPROACHES TO FRESHWATER FISH CONSERVATION. *American Fisheries Society Symposium 91. Based on symposia held in Tampa, Florida, 23–24 August 2017 and Tampa, Florida, 21 August 2017.*

Edited by Daniel C. Dauwalter, Timothy W. Birdsong, and Gary P. Garrett. Bethesda (Maryland): American Fisheries Society. $79.00. xviii + 693 p.; ill.; no index. ISBN: 978-1-934874-57-8. 2019.

Worldwide, freshwater ecosystems are in trouble, signified by the rapid decline of aquatic species, especially endemic species. This is most noticeable

with fishes because they are visible and edible, and disappear as springs cease flowing, streams are depleted of water, and rivers and lakes are modified and polluted. In the United States, interest in protecting fresh waters centers around endangered species (160 fish now listed) and sport fisheries. There is, however, a growing realization that managing waterways at the scale of watersheds (catchments) is not only good for the biota but good for people, with such benefits as reducing the impacts of flooding, recreation, and providing habitat for a wide array of wildlife. This book is about watershed management and conservation, focused on fishes. It consists of 27 chapters, most of which could stand alone but have been reasonably well integrated by the editors. Most chapters focus on watersheds as the landscape units that are most amenable to conservation on a broad scale because such management can integrate human use with habitat conservation in a region with definable boundaries.

The useful introductory chapter is followed by four additional chapters that discuss multispecies approaches to aquatic conservation, which often wind up protecting or restoring watersheds. They are important introductions to large-scale efforts to protect native fishes: Western Native Trout Initiative, Desert Fish Habitat Partnership, National Fish Habitat Partnership, and similar partnerships in other regions. These multiagency cooperative ventures, as shown in the chapters, help to prioritize habitat restoration efforts over much of the U.S. They are valiant efforts but small compared to the need, often focusing on individual stream projects. Nevertheless, they are important and should be on the radar of fish conservationists nationwide. Importantly, they cross many jurisdictional boundaries. This volume is a good introduction to these projects.

Other chapters discuss fish conservation efforts by various states and regions around the U.S., including eight chapters about watersheds in Texas, which I enjoyed because I know so little about them. Many of these chapters talk about establishing Native Fish Conservation Areas (watersheds with intact native fish assemblages). An attractive feature of the book is the color photographs of streams that figure in the various conservation efforts discussed. They are the kind of photographs most of us fish biologists take of our study waters. They carefully frame the streams to make them look as wild and natural as possible. It reflects the apparent optimistic attitudes of the many authors that watersheds and streams can be saved to benefit future generations of both people and fish. In short, this is a useful and attractive volume for anyone interested in aquatic conservation.

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From Catastrophe to Recovery: Stories of Fishery Management Success.

Edited by Charles C. Krueger, William W. Taylor, and So-Jung Youn. Bethesda (Maryland): American Fisheries Society. $79.00. xvi + 586 p.; ill.; index. ISBN: 978-1-934874-55-4. 2019.

In a world of endangered fishes and depleted fisheries, it is rare to read about management successes, perhaps because unequivocal examples *are* rare. Here, however, we have a compilation of 21 case histories of fish management that resulted in successful outcomes, from saving endangered species to restoring commercial fisheries. Most (16) are from fresh water in North America. The book begins with an excellent introduction by the editors who explain their goal of finding common themes in stories of management success. This search for commonality drives the similar formats of most accounts, a smart move on the part of the editors. Each includes, for example, a section on Lessons Learned. The introduction summarizes these lessons but notes that success is sometimes driven by fortuitous events, by skeptics (who force managers to define their goals clearly), and by being able to deal with uncertainty. Another commonality is the lengthy history of each project, which will be of great help to readers.

Stephens et al. present the 100-year history of managing California's spectacular golden trout. It took a major multiagency effort to save the trout, overcoming decades of poor management. Moore and Kulp show the difficulties of restoring native brook trout to a national park, in the face of unexpected obstacles such as hungry bears and local fishermen planting nonnative trout in restored reaches as a protest against big government. Thomas et al. discuss the recovery of the Ohio River (U.S.) from supporting just a few fish species in highly polluted waters to a river ecosystem once again supporting 100 species of native fishes. Part of the reason this happened was the federal Clean Water Act in 1972, a theme in other accounts as well. Thus, Weidel et al. show how deepwater sculpin unexpectedly became abundant in Lake Huron, following its extirpation, the result of improved water quality. Kraft tells the story of recovery of Adirondack mountain lakes from acidification by acid rain; recovery was largely due to legislation that curbed air-borne pollutants. In Sweden, Hellström et al. show how the restoration of the Vindel River from abusive logging practices allowed fisheries for brown trout and Atlantic salmon to re-establish. This served as an example for restoration of other rivers in the Baltic region.

All of the cases had their special challenges, but most were successful because there was a group of people, often academic and agency fish biologists, who were dedicated to restoring their local waters