



## Book Reviews

*Edited by Richard H. McCuen*

**Co-Engineering and Participatory Water Management: Organizational Challenges for Water Governance**, K.A. Daniell. Cambridge University Press, 100 Brook Hill Dr., West Nyack, NY 10994-2133. 2012. 335 pages. \$140. ISBN 978-1-107-01231-8.

*Co-Engineering and Participatory Water Management: Organizational Challenges for Water Governance* fills an important gap in the literature both increasing our understanding of the strengths and weaknesses of different decision support and participatory water management approaches and empirically testing a new collaborative model for interorganizational cooperation where multiple organizations work together to initiate, design, and implement (co-engineer) a participatory modeling process to inform decision making. Although there has been scholarship and theory on decision aiding and participatory modeling, this book advances the field by extending that work to examine co-engineering of participatory modeling in an interorganizational context. Given the breadth of coverage in this text from the theoretical literature (e.g., the theory of decision aiding, participatory modeling, and co-engineering), to research methods and in-depth examples of co-engineering and participatory modeling for decision aiding in two river basins, this text may be of use to a wide audience.

Scholars and students specializing in water resources management or governance will find this book a good reference given the range of literature reviewed early in the text and in the appendices and the careful and transparent research design and methodological approach for the empirical work detailed in the later chapters of the book and in the appendices. While the author aims to write for practi-

tioners (planners, policy makers, engineers) in broad terms, the book will appeal to and be most useful for those who intend to engage in co-engineering, inter-organizational participatory modeling efforts. Finally, educators wishing to develop course material on participatory water resources management and planning may find this book an excellent resource.

The book comprised two parts with five chapters each plus a series of appendices which provide more detailed methodological information and more in-depth literature reviews of particular topics. The first chapter makes the case for why co-engineering participatory processes for decision aiding is necessary for solving 21st Century water management problems and why this is an important, yet understudied area of research. The focus on 21st Century water planning and management in Chapter 2 (together with Appendix A) serves to contextualize the book and to support the argument that water management today is more complex and thus co-engineering and participatory management approaches are needed. Unless one is a water planning and management novice, most readers will find it acceptable to skip this chapter. Chapters 3, 4, and part of Chapter 5 review a wide set of literature on decision aiding and participatory modeling setting the stage for the methodological approach and research design outlined in the second half of Chapter 5. Unfortunately, the broad coverage means the reviews tend to lack depth. There are a few areas where Daniell deepens her review such as in Chapter 3 where there is a brief, but useful comparison of the strengths and drawbacks of participatory modeling methods. Readers in search of greater detail should look to the appendices where the author spends more time describing scholarship in the areas of decision aiding and participatory modeling.

The second half of Chapter 5 and Chapter 6 begin the research intensive portion of the text. In these chapters, the author describes the methods employed to investigate the impact of co-engineering on participatory modeling for collective decision aiding. Chapter 6 provides more detail on the research design including case study selection and data collection methods and approaches. The author also describes the pilot study in some depth where the co-engineering participatory modeling methodology was tested among nine students at a university campus in Montpellier, France. Chapters 7 and 8 describe the two real-world applications of the methodology for the Lower Hawkesbury Estuary in Australia and for the Upper Iskar Basin in Bulgaria. Both chapters provide a deep description of the co-engineering process and discuss the advantages and disadvantages of participatory *vs.* less inclusive planning and management approaches. These chapters and Chapter 9, which compares the Australian and Bulgarian cases, mostly focus on the co-engineering process (i.e., the institutions/actors involved, co-engineering design, negotiation, etc.). Chapter 9 includes both a nice summary of the similarities and differences between the two cases (e.g., management-driven [Australia] *vs.* research-driven [Bulgaria], paid participants with lower base knowledge level [Bulgaria] *vs.* voluntary participation and higher local knowledge [Australia]) and reflections on co-engineering as a whole including a useful guide of best practice for co-engineering. Readers who want more information about the participatory modeling processes such as how information was solicited from participants (e.g., cognitive mapping, questionnaires) should look to Appendices D-F.

One of the weaknesses of the text is that it is difficult to fully grasp co-engineering and participatory modeling until mid-way through the text. Danielle defines these concepts early but spends so much time thinly covering a range of literatures, it is not until the research design for the empirical case studies is laid out in Chapters 5 and 6 that the concepts are fully illuminated. If readers take full advantage of the appendices to develop a deeper appreciation of the literature on decision aiding and participatory modeling, this could help.

The biggest strength of the text is the comprehensive review and explanation of co-engineering in each of the case studies in the main text with a similar comprehensive review and explanation of participatory modeling in the related appendices. Taken together, these chapters and appendices nicely describe an empirical methodology and practical application of co-engineering of participatory modeling in two interorganizational contexts.

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**Wetland Ecosystems**, W.J. Mitsch, J.G. Gosselink, C.J. Anderson, and L. Zhang. John Wiley & Sons, Inc., Hoboken, New Jersey 07030. 2009. 304 pages. ISBN 978-0-470-28630-2.

The book under review, *Wetland Ecosystems*, provides a comprehensive summary of the three main wetland ecosystems found in North America. These wetland ecosystems include coastal wetlands, freshwater swamps and marshes, and peatlands. The authors devote a separate chapter to each wetland ecosystem type, elaborating within each on the specific characteristics of each general ecosystem type. Coastal wetlands were further divided into three sub-categories, tidal salt marshes, tidal freshwater wetlands, and mangrove wetlands. Similarly, freshwater swamps and marshes were divided into freshwater swamps and freshwater marshes.

In each chapter, the general wetland ecosystems are first defined within both a geographical and a landscape context. The climatic and hydrologic conditions required to support each ecosystem are also discussed. Peatlands, for example, generally exist in colder, humid climates, and are heavily dependent on precipitation to maintain water levels. Therefore, peatlands can only exist in areas where precipitation exceeds evapotranspiration (pp. 149-151). Coastal wetlands are also further divided into more specific wetland types based on salinity and landscape location. Mangroves and salt marshes are found in waters with a salinity between 30 and 5 ppt. whereas freshwater marshes are defined by salinities of less than 0.5 ppt. (p. 21).

Each chapter goes on to discuss the hydromorphology, vegetation types and distributions, soil properties, habitat and wildlife present, ecosystem functions, and overall ecosystem energy and nutrient flows and fluxes of each specific wetland type within each ecosystem category. To define habitats, three main subgroups and associated wildlife were defined, the aerial, benthic, and the aquatic habitats. Wetland dwelling mammals are listed apart from these habitat groups, which was appropriate because a number of wetland mammals move between multiple habitat subgroups. Special emphasis is also placed on ecosystem functions including primary productivity, decomposition and consumption, and organic/nutrient fluxes.

The final chapter outlines three major methods of studying wetland ecosystems including: (1) the use of mesocosms, (2) whole ecosystem studies, and (3) mathematical modeling. A number of studies are used to give examples of each methodology. In addition, a short segment on the construction of models using the program STELLA is included.

Overall, the book is very informative and well organized. The authors do a good job in evenly addressing each wetland ecosystem. While some aspects are more emphasized in different ecosystems and vice versa, I believe that it is done appropriately so. Peatland ecosystem types, for example, are not as distinctly different as different coastal wetland ecosystems and are therefore not in-depthly explained. The topics covered within each chapter (i.e., hydro-morphology, vegetation, etc.) matched the ecosystem-centered aim of the authors.

Although the ecosystem flux diagrams were helpful and concise, the notation was confusing and not defined well in the Appendix on p. 237. The authors assume that the reader is familiar with the ecosystem language, which will not be true for the primary intended audience of undergraduate students with little background in biology, chemistry, and physics. While a mention is made to an external source for clarification on these ecosystem symbols on page 4, I feel even an extra page of symbol definitions would make the book much more complete.

Some of these ecosystem diagrams are a bit overwhelming (e.g., Figure 5-15 on pp. 218-219). Wetlands are very complex and should be portrayed as such, but an undergraduate audience with little science background may struggle without more introduction or explanation than currently exists. Aside from these diagrams, the authors do an excellent job of breaking down wetland ecosystems into digestible bites for undergraduate students. Such diagrams, however, would be appropriate for graduate students using the book as a supplementary source. The landscape cross-sectional diagrams (such as those shown on pp. 47, 67, and 159) were especially helpful in understanding the extent and variation in wetland environments. Diagrams with nutrient and energy flow budgets were also very nicely done.

The STELLA modeling portion of the final chapter was weak. While, this book is meant as an introduction, I feel complicated, abstract diagrams are not the best teaching methods for introducing the complex inner workings of wetland ecosystems. The inclusion of very simple examples, which used only one or two ecosystem symbols could help students better grasp the modeling language.

The book is generally well written, but does have a number of typos. I would suggest another read through of the book to remove any lingering errors.

All diagrams and pictures are well placed and relevant to the text. The Appendix could be expanded to include more in-depth ecosystem symbol definitions. The index was well formatted and made the book very accessible. Overall, the book is very informative, current, and easy to navigate.

As is, *Wetland Ecosystems* should be used as a reference for graduate students and researchers concerned with wetland science. It is a very good first reference for such readers to quickly learn about different wetland types and their specifications. If more explanation was added with respect to the ecosystem diagram and language, the book would also be a good reference for undergraduate students taking a wetland introductory class. I personally would buy the book as a reference and will most likely use it in my research to define wetland habitat, nutrient budgets, and energy flows.

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**River Republic: The Fall and Rise of America's Rivers**, D. McCool. Columbia University Press, 61 West 62nd St., New York, New York 10023. 2012. 388 pages. \$34.50. ISBN 978-0-231-16130-5.

Picture your favorite place on a river. As water professionals, we are almost certainly attracted to rivers and probably have our own unique memories of a special time. In his latest book, Dan McCool taps into that special feeling and links it to the evolving world of water policy and politics across the United States.

In *River Republic: The Fall and Rise of America's Rivers*, McCool takes us on a journey across both time and space, exploring the history of the exploitation and management of rivers, and how it has played out and continues to play out in diverse watersheds from the Kissimmee to the Penobscot to the Columbia to the Colorado and many places in between. The title gives a sense of his central thesis: the future of rivers will be more democratic with management that takes people's broader needs into account.

He begins with "Part I: The Fall," presenting classic case studies of Corps of Engineers and Bureau of Reclamation projects. He explores some of the same ground as Marc Reisner's *Cadillac Desert*, but also pokes into some issues from other regions. In "Part

II: Dismemberment,” he takes on a variety of topics, including agriculture, hydropower, navigation, flood control, and pollution. For each topic he builds his case that a particular interest has exploited river resources to the detriment of most other uses. “Part III: Resurrection,” explores urban restoration, habitat and endangered species, and river recreation. Across a landscape of rivers and issues he shares a lifetime of experience and research to make his case.

This book was fascinating for me. McCool is a professor of political science at the University of Utah. I found his previous books on Native American law and water issues to be well written and compelling. It led me to invite him to speak at the agency for which I work and gave me a chance to get to know him better. After his talk he was on his way to do interviews on the Snake River, which became a piece of *River Republic*.

But beyond having met the author, this book explores many issues I have worked on personally. For example, his discussions of Columbia River issues and the Clean Water Act addressed areas about which I have been involved intimately during my career. It is a bit like reading a travel guide for your own home town. It was interesting to see familiar landscape through someone else’s eyes. But at the same time, it is glaring when you find a description that is not quite right.

*River Republic* is broad and rich. At times, I found myself comparing the issues in his case studies to challenging projects with which I am involved, and wishing I could get some key players to read it. He sees the world of water from an eagle’s height, taking in the push and shove of players and issues. Yet, he also lands on the river’s edge and tells us personal stories of the people involved. It is an impressive story, well documented with over 60 pages of notes and references. It is clearly a life’s work for McCool.

McCool is on a mission. A dominant theme in his tale of river democracy is what he calls “instigators.” These are people who have dedicated themselves to changing the status quo and repairing a river. In case studies from all over the nation, we meet local folks who decided they want to make a change and doggedly worked at it until a river was reborn. He tells us about Sally Bethea and the Chattahoochee Riverkeepers, Bill Mix and the Friends of the Rappahannock, and Barry Kohl and the Coalition to Restore Coastal Louisiana. He sees a sea change occurring in how we view and manage rivers, and he wants to help it along. His heroes are these instigators, who are pushing to take rivers away from the control of special interests and restoring them for entire communities.

McCool combines the zeal of a visionary with a tendency toward snarky little comments. When the

National Research Council criticized the Corps’ “Principles and Guidelines,” McCool says “this emperor was stark naked.” He refers to salmon passing downstream through Snake River dams as being “chewed up by turbines.” This is one of those cases I know well, and it is a vivid image, but not very accurate. When he talks about the Clean Water Act and TMDLs, his critique is based on a particularly annoying use of jargon. But his explanations show a poor understanding of the program. In general, he seems at times to have a superficial understanding of environmental programs, but he attacks that which fails to fit his thesis with sarcastic loaded language. For me, this is disappointing and distracting. His overall vision of the issues seems solid, but the caustic commentary will probably make this book unreadable for some.

Which leads me to wonder about the audience McCool was intending to reach. This is not a textbook or an academic treatise. It is a very readable book for a well-educated general audience, but someone on the fence (or on the side being attacked) might be put off by the uncivil discourse. The tone of the book is of one preaching to the choir. In fact, in one place he starts quoting the Bible and refers to a “holy crusade.” Or perhaps his tone is set for the college students from his classes. So, I would assume that he is focusing his outrage on a market of young environmentalist readers who want to learn more about water, but are not annoyed by the tone or occasional fuzzy details.

For all of the criticism of the role of government, he seems to downplay the role of government employees as “instigators.” In one example, a state employee who was also a wrestling coach fined a company and used the funds to restore Eighteen Mile Creek in western New York, but for the rest of the story he is referred to as “the wrestling coach.” In his telling of the Condit Dam story (on the White Salmon River of southern Washington), he glorifies the local instigators, but I know from personal experience government and tribal fisheries biologists were prime instigators as well.

*River Republic* is broad and rich, but it is also somewhat shallow. Many of the areas of water that are fascinating in their complexity are simplified into a Manichean world of “good” instigators and “evil” river development interests and their government lackeys. For example, he states “on some rivers there is a very clear choice between what is rational and what is senseless — it’s like choosing between Santayana or a room full of birthers.” Say what? In my 30 years in water resources, I have never seen that clear of a choice (or rarely seen such an odd metaphor). In fact, this sentiment seems to contradict another part of his thesis that success comes when

diverse groups talk to each other and find common ground.

Since McCool is a political scientist, there were places where I was surprised to not see a more detailed analysis of the interests competing for use of the river. Economic interests often have compelling stories of public benefit for their uses of rivers. The diversity of interests and complex array of alliances and political clout are what make water controversies challenging and fascinating. But McCool seems to prefer to boil these stories down to fit his proscribed theme.

The consequence of this distillation is his conclusions seem almost Pollyannaish. I am his fan when it comes to new paradigms for water management and the recognition of the role of citizen activism, but not all instigators are successful. The River Republic he dreams of is hard to put into place in the real world. Sometimes the interests aligned to continue the old ways that cannot be easily overcome. I appreciated the inspiration of instigators who have been successful, but what made them successful? McCool states that rivers are “a kinetic form of politics storing potential for an instigator.” This suggests that everything can be fixed if you can just find an instigator. But the reality is more complex. What elements need to be in place for an instigator to be successful? A deeper analysis of this subject would have been more insightful and useful.

Despite these criticisms, this is a good book. It is interesting and readable. Water professionals may see familiar territory, and environmentally minded folks will be inspired. I would recommend it to friends and may use it in my undergraduate environmental studies class. If you can put up with the occasional potholes, it is an amazing journey.

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**OTHER BOOK RECEIVED**

**Environmental Compliance Guidebook: Beyond U.S. Water Quality Regulations**, C. Herndon and S. Hemming. American Water Works Assn., 6666 W. Quincy Ave., Denver, Colorado 80235. 2013. 316 pages. ISBN 978-1-583-218570.

This book has everything you need to ensure your utility is compliant with U.S. environmental laws.

The chapters include discussions of the 11 U.S. environmental protection laws and how they affect your water or wastewater utility. Laws and regulations that address safe handling, disposal, and storage of regulated substances are clarified to help your utility stay in compliance. A CD-ROM provides the compliance checklist you can download and print. The CD also includes other valuable material.