
This book aims to take a holistic science perspective towards agricultural land management and its impacts on downstream water quality. It contains contributions from different disciplines, including agronomy, aquatic ecology, chemistry, hydrology, and soil science. The volume is separated into three sections: (i) agriculture as a potential source of pollutants, (ii) hydrology as the transport, and (iii) impacts and case studies from around the world. The first section details many of the factors and processes determining the fate of nutrients, with chapters on nitrogen, phosphorus, manure, pesticides, heavy metals, pathogens, and sediment in agriculture. It concludes appropriately with a chapter on nutrient balances. The contributions fit together nicely and give a good overview of the primary pollutants and associated processes.

The second section considers hydrological controls on the source of pollutants at the soil profile scale, before moving to pollutant mobilization at the field scale, and then, through modeling, at the catchment scale. The collection of chapters relate to techniques for characterizing and modeling the hydrology and nutrient fluxes at specific sites. Chapter 10 on pollutant mobilization at the field/slope includes some interesting commentary on the scale chosen to study the transfer of waterborne pollutants and apparent mobilization processes and transport pathways. This second section continues with chapters on interactions between pollutant (phosphorus) and sediment, quantifying sediment and nutrient pathways, using geographical information systems for studying nutrient and sediment transfer, and finally, wetlands as regulators of pollutant transport. This section does not read as well as the first because there is a mixture of chapters with descriptive location-specific studies, more generic process synthesis, and methodological approaches. These are not always well interlinked.

The third and final section contains seven water quality case studies from around the world. The first case study (Chapter 16) is on solutions to nutrient management problems in the Chesapeake Bay watershed in the USA. I found the description of this long-term watershed management effort to be well worth reading. It highlights the interactions between science delivery, planning, land and water management actions, impediments to adoption, and policy drivers. This is a valuable case study with lessons that can be applied elsewhere. Chapter 18 also takes a watershed (or catchment) management perspective in describing some of the management issues, approaches, and needs for the Murrumbidgee River in Australia. This case study points out the breadth of considerations in integrated watershed management and some of the approaches being applied locally. Chapters 17, 19, 20, and 21 provide case studies from New Zealand, Northern Ireland, Zimbabwe, and Australia. These provide well-written reviews of local water quality issues, management options, and challenges. The final chapter examined linkages between terrestrial and aquatic landscapes with respect to nutrient transfer and aquatic landscapes. This chapter is significant because it provided important linkage between agricultural land use and the impacts of added nutrients on the aquatic environment. Such linkage is often missing in our research.

Overall the book is successful as a compilation of material from different disciplines and in providing valuable up-to-date reviews and case studies from different parts of the world. While the intent was to contribute to an interdisciplinary approach to managing water quality, the collection of material is probably more multidisciplinary in nature. The book would have benefited from more truly interdisciplinary case studies of water quality research and management at the watershed scale. Their absence somewhat reflects the state of our science, but other good examples could have been included to complement the Chesapeake Bay case study. This would have strengthened the book. In my view Sections 2 and 3 would also have benefited from content decisions that enabled better sequencing of chapters and development of specific themes.

This volume is not likely to constitute one of your primary must-have reference sources on water quality management. However, it is a significant contribution on the impacts of agriculture on water quality and contains some very good chapters. The scope of the material in the book is its strength—it provides a “one-stop shop” for readers to broaden their knowledge base across links between agriculture and water quality. The book is relevant to a wide range of people interested in water quality issues, from undergraduate students to senior researchers, and contains some very worthwhile reading.

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