



## Alpine Waters

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## Alpine Waters

Edited by Ulrich Bundi. Heidelberg, Germany: Springer, 2010. xiv + 278 pp. € 229.00. ISBN 978-3-540-88274-9.

The statement that “Mountains are the water towers of the world” with which Ulrich Bundi opens this volume is by now trite. It is, nevertheless, true. The mountain areas of the world provide water resources for power generation, agriculture, municipal and industrial consumption, and recreation in their surrounding lowlands, as well as for local use within the mountain environment. In the past decade, concerns over environmental change, including glacier shrinkage, permafrost degradation, and slope instability in mountain environments, have been added to those of increasing demands for water, large-scale flow diversions, and transbasin water transfers that have attracted attention for more than half a century. In this context, the appearance of this important volume is especially opportune and timely.

As volume 6 of the *Handbook of Environmental Chemistry*, *Alpine Waters* addresses multiple environmental and applied concerns in the western European Alps. After an initial chapter in which the editor provides a synthesis of the nature of the hydrologic cycle and its management, the volume contains 13 substantive chapters grouped into 4 major sections. The first group of 3 chapters treats the hydrologic cycle of the western Alps: its general characteristics, in the volume’s longest chapter; the potential impact of climate change on it; and human interventions in the cycle. The second set of 4 chapters is centered on

the chemistry of Alpine water. As in the previous section, this opens with a general description of the chemistry of large Swiss Alpine rivers, which sets the stage for the following chapters on acid deposition in Alpine lakes, glaciers as archives of atmospheric deposition, and organic contaminants. Two chapters on the ecology of mountain streams and rivers make up the third section: one on the habitat of Alpine streams and one on their flora and fauna. The final group of 4 chapters is the most disparate, consisting of case studies centered on hydropower generation, the downstream effects of reservoir management, the restoration of mountain rivers, and water management in the Himalaya.

This is an exhaustive collection of reviews on the physical, chemical, and biological hydrology of the western Alps and will be welcomed by researchers in mountain areas everywhere. For workers in European mountains, it provides a starting point and source; for scientists elsewhere, it offers a generally good review of recent research in the Alps and a source of the primary materials on which that review is based. As with many compilations of this sort, the individual chapters vary in quality. Some offer useful, comprehensive reviews; others are less comprehensive. For me, the strongest contributions are those in the first section, on the physical hydrology of the mountains. Those on geochemical and biological topics seem less comprehensive, although this may reflect a shorter history of research that has involved fewer workers. The section of case studies, although useful, seems to have been something of an afterthought, most evident in the inclusion of the chapter on problems of water management in the Himalaya.

*Alpine Waters* is attractively produced, which speaks to the dedication of its editor. A consistent style of text, figures, and reference lists helps make this more than a collection of individual contributions, as does frequent cross-referencing between the chapters. Each chapter includes reference lists, often amounting to more than 50 items, which will, perhaps, be its greatest value to researchers and students outside Europe. Unfortunately, the index is not as useful as the rest of the volume: it appears to have been largely compiled from the lists of key words for each chapter and the chapter subheadings rather than the full text. However, this should detract little from the scientific value of an attractive book.

Finally, although the editor’s expectation that generalizations drawn from the Alps will prove “universally valid” may be broadly true, many researchers outside Europe will have reservations: all alpine environments are not the same. In raising this comment, I think that part of the importance of this volume lies in its implicit suggestion of the need for equivalent reviews of the hydrology and geochemistry of the other major mountain ranges of the world. It will be interesting to see if this challenge is taken up elsewhere. Meantime, the editor of, and contributors to, *Alpine Waters* deserve thanks for setting a good precedent.

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