

PREFACE

“Writing a book is an adventure. To begin with it is a toy and an amusement. Then it becomes a mistress, then it becomes a master, then it becomes a tyrant. The last phase is that just as you are about to be reconciled to your servitude, you kill the monster and fling him to the public.”

WINSTON S CHURCHILL.

From a speech about authorship, National Book Exhibition at Grosvenor House,
London, 2nd November 1949.

Thank you for picking up this book. Water is essential to all life and hydrology its study deals with all aspects of its occurrence on Earth. Earth, the 'Blue Planet', has three quarters of its surface covered by water and is the only body in the solar system on which water is known to exist in large quantities. Since ours is literally a water world, the growth of hydrology as both a practical study and a science is not surprising. Early knowledge of water developed almost exclusively through local attempts to manage and control it. However, the water which exists in such abundance on the Earth is unevenly distributed in both time and space, and its circulation, closely enmeshed with the circulations of the global atmosphere and oceans, is a vital component of the Earth's energy machine. Indeed much of the current impetus for the advancement of hydrology as a science comes from our increasing interest in and concern about climate variability and climate change and the key role of the global water circulation.

Water is essential to life but excessive variations bring disasters in the form of floods and droughts and its management and appropriation have already become the source of international tension and even potentially of regional conflict. Furthermore, as the world population continues to grow, the pressures exerted on and by water will also increase and over the next half-century large areas of the world will have insufficient water to meet their needs. Hydrology is therefore more important than ever before and certainly the need for a clear understanding of the operation of hydrological processes at all scales has grown significantly since the first hydrological textbooks were

published more than 60 years ago.

Hydrological processes, and our improved understanding of their operation, dominate this discussion of the principles of hydrology. The structure of this book contains chapters in logical sequence of the hydrological cycle devoted to the major components of the hydrological cycle, each with up-to-date references and discussions. In addition, a concluding chapter has been added to draw together some of the ideas which are developed through the book and look to new developments and challenges ahead. There are web links for further information as well as Review Problems and Exercises at the end of each chapter.

We have included a wide range of recent references, as well as some seminal historical ones, as guidance for readers who wish to follow up specific topics in more detail. Inevitably, however, our selection is a personal one and in any case represents only a minute fraction of the growing stream of publications in the relevant journals. Fortunately, access to this great body of literature, is easier now than at any time, via libraries and in particular the Internet, and it is assumed that many readers will access additional information from these sources. Similarly, with the growth of the Open Data movement, access is more easily available to an increasing amount of environmental data including hydrology, and analytical tools for their study are readily available, such as spreadsheets (e.g. MS Excel and its free equivalent from Libreoffice.org) as well as more specialist numerical software.

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