

# Elementary Hydrology

By

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This is a very welcome publication providing under one cover a balanced treatment of basic principles and current practices in engineering hydrology, particularly surface water hydrology. A number of text books have come up in last two decades on the basic principles of hydrology but the present book is a balanced text covering the various facets of hydrology to the required extent. With the environmental movements gaining momentum every day a time has come when the hydrologists have to prove to the common man, planners and politicians their immense importance for solving day to day water problems and this book takes the hydrologist in this direction. The author is a well known hydrologist at international level and he has put at one place his own and other experts' experience to create in readers a basic and undying interest for hydrology. It is a welcome, commendable and successful effort.

The book opens with a chapter on introduction to hydrology and covers definition, hydrologic cycle, hydrologic budget, space-time scales in hydrology, brief about hydrologic data and units of measurement. The basic concepts are suitably backed by numerical examples which are real world and interesting. A section is devoted to history of hydrology, the worth of which is the references.

The next chapter is devoted to the relationship between environment and water resources covering the inventory of world water resources and applications of hydrology. The chapter is ideally suited for showing the impacts of hydrology and hydrologists on day to day life betterment.

The third chapter is devoted to basic characteristics of watersheds and types of watersheds. The next chapter can be the heart of hydrology and deals with parameter estimation covering method of moments and method of least squares. Very simple but real life solved problems are given to help the readers. It would have been appropriate to have this chapter, which is very important, a little later.

The fifth chapter brings out the description of drainage basin characteristics with balanced description relating to characteristics, sub-surface environment, classification and flood plains. The next chapter is devoted to weather and precipitation encompassing characteristics of the atmosphere, water vapour and its indices. temperature variation with altitude, air circulation & items related to weather like pressure, climate control, types of precipitation etc. The seventh chapter is devoted to precipitation measurement, analysis of data. It is very useful chapter clearly defining the input to the hydrologic system. It is a good combination of conventional and recent information backed by useful numerical examples of real world. The chapter is of immense importance for practical hydrologists.

The next part of the book is devoted to sub-surface flow covering infiltration and soil moisture along with ground water and base flow. The part shows association of hydrology with agronomy and geology. The author has also provided little material for advanced readers.

The chapter twelve and thirteen focus on above surface flows and abstraction. The chapters would be of immense help to designers. The author establishes an interesting link among hydrology, aerodynamics, agricultural and forest hydrology. The chapters cover evaporation process, factors affecting evaporation, measurement of evaporation, transpiration and evapotranspiration. Good information has also been provided on interception, depression storage etc.

Chapter twelve provides useful information on streamflow measurement, hydrograph analysis. A brief introductory overview of complex hydrographs and effective rainfall. It is a good information base for students and practising engineers. The next six chapters from fourteen to nineteen deal with precipitation-run-off relation. The coverage is to estimation of surface run-off volume, unit hydrograph method, synthetic unit hydrograph, conceptual models of unit hydrograph, estimation of peak discharges and snow modelling very lucidly the important concepts of basic hydrology with solved examples have been explained.

The Chapters twenty and twenty-first provide underlying principles of reservoir flow routing and channel flow routing discussing methods of flow routing through reservoirs, open channel. The governing equations with solved examples give interesting reading.

In chapter twenty second and twenty third a slight advance treatment has been given covering watershed simulation and building watershed simulation and building up of models. The last two chapters conclude the book and deal with hydrologic design involving statistical methods. The good coverage of frequency analysis and methods of estimating design storm and design flood have been given.

The book is an excellent text book for hydrology students at undergraduate and post-graduate level and shall serve this purpose for developed and developing countries. The book shall serve this purpose because of its lucid language and ample solved examples. The problems chosen are real world problems which make the subject easily understandable. The book shall also serve the researchers because of its practical bent of information. The book is highly recommended for anybody who are remotely related to water resources development. The presentation is simple and lucid, at some places too lucid, for developing as well as under-developed countries. The best part of the book is the avoiding of heavy mathematics, which is the fashion of present day authors.

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