Review of *Impact of Climate Change on Water Resources: With Modeling Techniques and Case Studies* by Komaragiri Srinivasa Raju and Dasika Nagesh Kumar

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For more than two and a half decades, there was a considerable debate on climate change and global warming. Now under the weight of growing evidence, the debate is more or less settled, and it is hard to deny that climate change is for real. The questions that loom large are related to the impact of climate change: What? How much? Where? When? Climate change is a global phenomenon, but its impacts are local. It is the local impacts that are critical for devising engineering solutions. Climate change impacts the society in virtually all aspects and indeed the civilization. The book by Professors Srinivasa Raju and Nagesh Kumar deals with one aspect, water resources, which is vital for our survival and impacts in one way or another almost all other aspects. Therefore, the book is timely.

The subject matter of the book is divided into six chapters and three appendixes. The first chapter introduces climate change and variability and then discusses climate feedback, forcing mechanisms, Intergovernmental Panel on Climate Change (IPCC) climate scenarios, and teleconnection patterns, and concludes with a set of thought-provoking qualitative questions. It is a well-written chapter.

Chapter 2 deals with the selection of global climate models (GCMs). Introducing global climate models first, it presents performance indicators for evaluating GCMs and then discusses normalization techniques, weight computing techniques, multicriteria decision-making techniques in deterministic and fuzzy scenarios, Spearman's rank correlation coefficient, and ensemble of GCMs. The chapter concludes with a number of questions. The material in the chapter can be gainfully used and is presented in a systematic manner.

Downscaling techniques are presented in Chapter 3. These techniques are logically divided into statistical downscaling and multisite downscaling. Multiple regression, artificial neural networks, statistical downscaling model, change factor technique, and support vector machine are included in statistical downscaling. The chapter concludes with nested bias correction, followed by a multitude of questions.

Chapter 4 deals with statistical and optimization techniques in climate modeling. Beginning with a brief introduction, it goes on to discuss data compression techniques, trend detection techniques, and optimization techniques. Included in data compression techniques are cluster analysis, fuzzy cluster analysis, Kohonen neural networks, principal component analysis, and F-statistical test. Trend detection techniques include Kendall's rank correlation test and turning point test, whereas optimization techniques cover linear programming, nonlinear programming, and evolutionary algorithms.

Hydrological modeling constitutes the subject matter of Chapter 5. With a brief introduction, the chapter discusses the Storm Water Management Model, the Hydrologic Engineering Center-Hydrologic Modeling System, and the Soil and Water Assessment Tool, and names other modeling techniques. A set of questions concludes the chapter. The chapter is brief but well written.

Chapter 6 presents case studies that discuss the evaluation of global climate models for maximum and minimum temperatures; downscaling of climate variables using support vector machine and multiple linear regression; climate change impact on semiarid catchment water balance using an ensemble of GCMs; comparing impacts of climate change on streamflow in four large African river basins; hydrologic impacts of climate change on the Murray–Hotham catchment of Western Australia; intercomparison of statistical downscaling methods for projection of extreme precipitation in Europe; future changes in the Mekong River basin hydrology with focus on the impact of climate change and reservoir operation on discharge; and regional rainfall forecasting using large-scale climate teleconnections and artificial neural networks. These case studies are highly insightful and add much value to the book.

Three appendixes on representative data sources, a representative list of journals on climate change and allied fields, and a representative list of books on climate change and allied fields conclude the book. These appendixes will be quite useful for students and those who want to begin work in the area of climate change and its impact on water resources. The book is well written, and references at the end of each chapter are good although some important references are missing. It will be useful to students, faculty, as well as water resources planners and managers. Both Professors Srinivasa Raju and Nagesh Kumar deserve applause for bringing out this timely book.