An Electronic Book from

The EnviroComp Institute

Environmental Sciences and Environmental Computing
Vol. II

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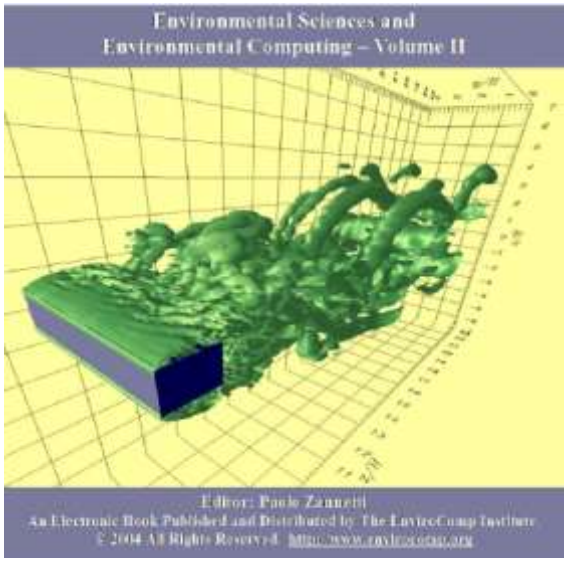

This electronic book presents a peer-reviewed collection of chapters in Environmental Sciences and Environmental Computing (ESEC) . This is the second volume of a series of electronic books in this field published by the EnviroComp Institute[1].

The EnviroComp Institute has pioneered the production of electronic books in environmental sciences[2]. This format allows the incorporation of features not available in printed books, such as hypertext, text search capabilities, Internet pointers, high-resolution color pictures, and animations. Another new, and hopefully useful, feature of this book series is that it has its own Web page[3] where readers and potential readers can visit for information on forthcoming volumes, purchasing options, errata/corrige, and other relevant issues. In addition, there is a unique forum in which readers and chapter authors can publicly discuss the important issues raised in the books.

This book series aims at presenting review papers and case studies on subjects related to environmental sciences and environmental computing. Most of the chapters deal with

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1 www.envirocomp.org

2 www.envirocomp.org/pubs

3 www.envirocomp.org/esec

environmental pollution in all media (air, water, soil, groundwater, and biota), with particular emphasis on the computational aspects, such as data analysis, simulation modeling, numerical forecasting, optimization, and computer visualization.

In Volume I of the series[4] , we presented a set of five technical chapters and three special chapters. The table of contents of Volume I can be examined at http://envirocomp.org/flyers/esec1_flyer.pdf. The five technical chapters dealt with: air pollution issues in Madrid, Spain, and Mexico City; ecodynamics models for oceanic studies; soil and groundwater pollution in Australia; and global climate change. The three special chapters provided a survey and available information on the Internet for the following environmental topics: technical disciplines, government institutions, professional societies, ecological modeling, atmospheric sciences, and air pollution modeling.

This Volume II presents 13 technical chapters discussing:

1. The use of computational fluid dynamics (CFD) to simulate air pollution among complex urban geometries.
2. Empirical models for short-term forecasting of air pollution episodes.
3. The application of a reactive transport model to simulate water pollution in a river.
4. A discussion on brine disposal from inland desalination plants.
5. A review of recent solute transport models for soil and groundwater contamination.
6. A case study of modeling nutrient dynamics in cultivated soils.
7. A hazard assessment study using a numerical model to simulate debris flow.
8. A simulation of ocean iron enrichment using ocean modeling techniques.
9. A simulation and animation of global marine Chlorophyll using ocean modeling techniques.
10. A study of the statistical properties of extreme sea waves.
11. A large eddy simulation (LES) study of environmental flows.
12. A decision support system (DSS) for the management of environmental emergencies.
13. A discussion on artificial intelligence (AI) techniques to deal with uncertainties in environmental studies.

This electronic book is distributed on CD-ROM and can be read, examined, searched, and printed with any computer system (PC/Mac/Unix) using the free software (Adobe Acrobat Reader) included as part of the CD-ROM. The book is fully hyper-texted and contains a large number of color pictures and pointers to Internet Web sites.

[4] http://envirocomp.org/flyers/esec1_flyer.pdf

Table of Contents for Volume II