COMPUTER MODELS IN ENVIRONMENTAL PLANNING

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*To my parents, Jack and Rose Gordon; and to my family, Gaybrielle,
Ben, and Tim—for their love and support.*

Preface

The purpose behind *Computer Models in Environmental Planning* is to provide a practical and applied guide to the use of these models in environmental planning and environmental impact analysis. Models concerning water quality, air quality, stormwater runoff, land capability evaluation/land information systems, and hazardous waste disposal are reviewed and critiqued. I have tried to emphasize the practical problems with data, computer capabilities, and other analytical questions that must be faced by the practitioner attempting to use these models. Thus, I do not delve too deeply into the theoretical underpinnings of the models, referring the reader instead to specialized references in this area. For each environmental area, I review the major models and methods, comparing their assumptions, ease of use, and other characteristics. Practical examples illustrate the benefits and problems of using each model.

Computer models are increasingly being used by planning and engineering professionals for locating and planning public works, and industrial, commercial, and residential projects, while evaluating their environmental impacts. The requirements of the National Environmental Policy Act and related state laws as well as separate state and federal laws concerning air and water quality, stormwater runoff, land use, and hazardous waste disposal have made the use of these methods mandatory in many circumstances. Yet, explanations of both the benefits and problems associated with supposedly easy-to-use computer versions of these models and methods remain, at best, difficult to retrieve and, at worst, incomplete.

A number of federal and state agencies have invested rather heavily in the development of computer models. In some instances, one can make the case that the investment has been wasted. The documentation may be impossible to decipher, if it exists at all, or there is no correlation between the documentation and the computer code. One does not wish to waste time trying to learn that this is the case. In many other cases, these problems do not occur. In fact, there are many

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computer models that are well documented, readily transportable to other systems, and of great use in answering the required environmental questions under state and federal laws and regulations. Unfortunately, the information on which models are available, how they can be acquired, and which are worth the investment in time, effort, and other resources is scattered among a wide array of government documents. This makes it quite difficult for those not intimately connected with the development of the models to acquire and use them.

To this end, I have tried to assemble in one place a comprehensive review of the major modelling efforts in the environmental planning arena. I hope it will help practitioners to incorporate such models into their work, and that it will help students of environmental modelling obtain a useful overview of the practical aspects of simulation modelling and impact analysis.

STEVEN I. GORDON

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Any ideas and opinions are, of course, my own and should not be attributed to these individuals or organizations.

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