

PREFACE

Systems ecology, also called ecosystem theory, offers today a complete theory about how ecosystems are working as systems. The theory will inevitably be improved in the coming years, when it hopefully will be used increasingly to explain ecological observations and to facilitate environmental management including the use of ecotechnology. The theory is, however, sufficiently developed today to be presented as a complete theory that offers a wide spectrum of applications. Only through a wider application of the theory – or let us call what we have today propositions of a theory – it will be possible to see the shortcomings of the present theory and propose improvement of the theory.

The book consists of three parts. The part Ecosystems as Systems emphasizes the system properties of ecosystems including the presentation of basic scientific propositions to a theory in the chapter Fundamental Laws in Ecology, while the part Ecosystem Properties gives a more comprehensive overview of the holistic properties of ecosystems, which of course – not surprisingly – are rooted in the system properties and covered by the propositions. The part Ecosystems gives an overview of different types of ecosystems, how they function due to their characteristic ecosystem properties, and how the scientific propositions can be applied to understand and illustrate their characteristic properties.

It is my hope that this book will be utilized intensively by ecologists and system ecologists to gain a deeper understanding of ecosystems and their function and to initiate the development of ecology toward a more theoretical science that can explain and predict reactions of ecosystems. By such a development, it will be possible to replace many measurements that are often expensive to perform with sound theoretical considerations.

The book is based on the presentation of

- I. systems ecology as an ecological subdiscipline and
- II. a very comprehensive overview of all types of ecosystems with many illustrations of their characteristic properties

in the recently published *Encyclopedia of Ecology*.

Due to an excellent work by the editor of the Ecosystem Section, Donald de Angelis, and the editor of the Systems Ecology Section, Brian Fath, in the *Encyclopedia of Ecology*, it has been possible to present a comprehensive and very informative overview of all types of ecosystems and an updated ecosystem theory. I would therefore like to thank Donald and all the authors of ecosystem entries and Brian Fath and all the authors of systems ecology entries for their contributions to the *Encyclopedia of Ecology*, which made it possible to produce this broad and up-to-date coverage of a very important subdiscipline in ecology.

Sven Erik Jørgensen
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