



Critical Transitions in Nature and Society (Princeton Studies in Complexity)

By Marten Scheffer

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How do we explain the remarkably abrupt changes that sometimes occur in nature and society--and can we predict why and when they happen? This book offers a comprehensive introduction to critical transitions in complex systems--the radical changes that happen at tipping points when thresholds are passed.

Marten Scheffer accessibly describes the dynamical systems theory behind critical transitions, covering catastrophe theory, bifurcations, chaos, and more. He gives examples of critical transitions in lakes, oceans, terrestrial ecosystems, climate, evolution, and human societies. And he demonstrates how to deal with these transitions, offering practical guidance on how to predict tipping points, how to prevent "bad" transitions, and how to promote critical transitions that work for us and not against us. Scheffer shows the time is ripe for understanding and managing critical transitions in the vast and complex systems in which we live. This book can also serve as a textbook and includes a detailed appendix with equations.

- Provides an accessible introduction to dynamical systems theory
- Covers critical transitions in lakes, oceans, terrestrial ecosystems, the climate, evolution, and human societies
- Explains how to predict tipping points
- Offers strategies for preventing "bad" transitions and triggering "good" ones
- Features an appendix with equations

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Review

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"Scheffer's book is a good read. It is fluently written and breathes authority, while still being highly consistent in its terminology."--**Carsten F. Dormann, *Basic and Applied Ecology***

"We recommend this book as the best integration of the multiple rubrics (resilience, regime change, panarchy, complexity, dynamical systems theory) found on the subject of critical transitions or abrupt change, and as an enjoyable as well as enlightening synthesis of a timely and important topic bearing on many of the crucial dilemmas of our time."--**William A. Reiners, *Ecology***

"The marvelous Scheffer's book is strongly recommended for all geoscientists because of three main reasons. First, it explains the outstanding importance of critical transitions in the abiotic, biotic, and social evolution and establishes a helpful framework for their further studies. Second, this book gives an exceptional opportunity to realize how broad, even philosophical treatment of very particular ideas can facilitate development of the tatters. Third, the author was very successful in demonstration of how do general laws work in the both nature and society. This unconventional book is very informative, well-written, and stimulating, and, consequently, nobody will lose her/his time reading it."--**Dmitry A. Ruban, *Zentralblatt fur Geologie und Palaontologie***

From the Back Cover

"This is an important book. Critical transitions and resilience are powerful explanatory tools in ecology today, and it is significant that Scheffer, the leading expert in the applications of critical transitions in ecology, has written a monograph in this area. Scheffer is an excellent writer, and a very good expositor of theoretical concepts in ecology. The ideas in this book should be part of every educated person's mental framework."--**Donald L. DeAngelis, University of Miami**

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About the Author

Marten Scheffer is professor of environmental sciences at Wageningen University in the Netherlands. He is the author of "Ecology of Shallow Lakes".

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