



# Ecological Climatology: Concepts and Applications

By Gordon B. Bonan

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This book introduces an interdisciplinary framework to understand the interaction between terrestrial ecosystems and climate change. It reviews basic meteorological, hydrological and ecological concepts to examine the physical, chemical and biological processes by which terrestrial ecosystems affect and are affected by climate. The textbook is written for advanced undergraduate and graduate students studying ecology, environmental science, atmospheric science and geography. The central argument is that terrestrial ecosystems become important determinants of climate through their cycling of energy, water, chemical elements and trace gases. This coupling between climate and vegetation is explored at spatial scales from plant cells to global vegetation geography and at timescales of near instantaneous to millennia. The text also considers how human alterations to land become important for climate change. This restructured edition, with updated science and references, chapter summaries and review questions, and over 400 illustrations, including many in color, serves as an essential student guide.

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"...highly recommended for students in the atmospheric sciences and physical geography; and for reference libraries ... I congratulate Cambridge University Press on the quality of their workmanship in bringing this manuscript to publication."

Ted Munn, Bulletin of the Canadian Meteorological and Oceanographic Society

"The well-organized second edition of Ecological Climatology can serve as a basic guide for advanced students to help them visualize the relationship between climate change and ecosystem responses and services. The clear explanation of concepts through illustrations, equations, and color plates helps to explain the interaction between plant and climate systems."

V.G. Kakani, Choice Magazine

#### **About the Author**

Gordan Bonan is a senior scientist at the National Center for Atmospheric Research, Colorado. His research interests include the ecological and hydrological processes by which land affects climate and how natural and human changes in vegetation alter climate.

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