

Understanding large-scale ecosystem structure and function requires familiarity with the techniques, knowledge and concepts of plant physiology, remote sensing and modelling. This is the first textbook to provide the fundamentals of all three domains in a single volume, and to then apply cross-disciplinary insights to multiple case studies in vegetation and landscape science. These case studies include:

- Drought and Global Forest Mortality
- Boreal Forests
- Savannas
- Grasslands
- Tropical Montane Forests
- Seasonality in Amazon Rainforests
- Groundwater Dependent Ecosystems

A key feature of these case studies is an examination of relationships among climate, vegetation structure and ecosystem function to address such questions as:

- What drives seasonal and inter-annual patterns and variation in carbon and water flux above woodlands and forests?
- How can remote sensing and modelling be used to identify the location of groundwater dependent ecosystems and estimate rates of tree water-use?
- What causes the widespread forest mortality that has been documented around the world over the past two decades?
- What drives seasonal patterns in phenology and gas exchange in the Amazon?

This book is for advanced undergraduate students, graduate students and researchers who need to understand and apply knowledge from the disciplines of plant physiology, remote sensing and modelling. It allows readers to integrate and synthesise knowledge to produce a holistic understanding of the structure, function and behaviour of forests, woodlands and grasslands.

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