

T:VS 1

macroclimate and plant forms:
an introduction to predictive modeling
in phytogeography by E.O. Box

ELGENE OWEN BOX

Macroclimate and plant forms:
An introduction to predictive modeling
in phytogeography



DR W. JUNK PUBLISHERS THE HAGUE/BOSTON/LONDON · 1981

Contents

Preface by the T:VS Series editor/v

Foreword/vii

List of tables/xi

List of world maps/xiii

Chapter 1. Introduction/1

Chapter 2. Modeling ecological structure and function/5

A. World vegetation models in general/5

B. The current model/6

C. Model structure and technical considerations/7

Chapter 3. Ecological classification of world vegetation/11

A. Vegetation description and vegetation data/11

B. Ecophysiognomic characters of terrestrial vegetation/15

C. Life forms of world terrestrial vegetation/20

Chapter 4. Modeling the effective environment/27

A. Climate data/27

B. Selection of ecoclimatic variables/29

C. The ecoclimatic variables and their significance/31

Chapter 5. The ecological model: life-form limitation, cover and dominance/33

A. Ecological data/33

B. The environmental-limitation model/34

C. The cover model/42

D. The dominance model/42

E. Proximity to environmental limits/44

F. Interpreting vegetation formations/45

Chapter 6. Model results/47

- A. Model output and applicability/47
- B. Generating and mapping world results/50
- C. Overview of world ecoclimates/52
- D. Life-form prediction frequency/64
- E. Predicted plant-form distributions/64
- F. Predicting world vegetation types/94
- G. Physiognomic diversity of vegetation/94
- H. General observations and problems/101

Chapter 7. Evaluation of model results/103

- A. Site comparison of predicted and actual vegetation/103
- B. Vegetation and climate at unusual sites/122
- C. Vegetation sensitivity to climatic variation/123

Chapter 8. Conclusions and next steps/129

APPENDICES

Appendix A. Description of the plant types/133

Appendix B. Predicted vegetation at selected representative and well-known sites/175

Appendix C. Predicted vegetation at the validation sites/199

Appendix D. Actual vegetation at the validation sites/219

Appendix E. The macroclimatic data-base/235

Appendix F. The processing and mapping programs/237

References/243