

# Contents

Introduction Michal V. Marek

## Chapter 1

*D. Vačkář, D. Janouš*

Adaptation to climate change in complex pathways from molecules and ecosystems to society

7

## *Part I Climate change*

## Chapter 2

*J. Mikšovský, M. Trnka, R. Brázdil*

Manifestations of climatic teleconnections in Czech drought characteristics

15

## Chapter 3

*L. Dolák, L. Řezníčková, P. Dobrovolný, P. Štěpánek, P. Zahradníček*

Extreme precipitation totals under present and future climatic conditions according to regional climate models

27

## Chapter 4

*P. Štěpánek, P. Zahradníček, A. Farda, P. Skalák, M. Trnka, J. Meitner, K. Rajdl*

Climate projections for the Czech Republic based on Euro-CORDEX simulations

38

## *Part II Molecular and ecosystem level*

## Chapter 5

*K. Klem, K.B. Mishra, P. Hodaňová, K. Novotná, B. Rapantová, O. Urban*

Drought adaptation in plants: methods for phenotyping drought tolerance

50

## Chapter 6

*S. Juráň, K. Večeřová, K. Klem, C. Calfapietra, O. Urban*

The role of biogenic volatile organic compounds in plant responses to abiotic stress. A case study with Norway spruce

62

## **Chapter 7**

*N. Vrchotová, J. Tříška*

Influence of knotweed and impatiens plant extracts on the seedlings and content of phenolic compounds in the aerial parts of buckwheat **79**

## **Chapter 8**

*T. Chuman, F. Oulehle, P. Krám, J. Hruška*

Temporal trends and spatial distribution of sulphur and nitrogen deposition in the Czech Republic since 1900 **85**

## ***Part III Landscape and societal responses***

## **Chapter 9**

*O. Brovkina, F. Zemek, M. Heřman, P. Štěpánek*

Land-cover changes in relationship to environmental factors in the Znojmo and Třebíč districts, Czech Republic **95**

## **Chapter 10**

*M. Prokopová, O. Cudlín, R. Včeláková, P. Cudlín*

Indirect drivers of land use change in Eastern Europe: the past and the future **105**

## **Chapter 11**

*F. Zemek, J. Novotný, M. Píkl, M. Pivovarník, S. J. Khalsa*

Remote sensing assessment of the thermal regime in an urban landscape for adaptation pathways **119**

## **Chapter 12**

*E. Krkoška Lorencová, B. Lučková, Z. V. Harmáčková, A. Emmer, D. Vačkář*

Adaptation pathways and cost assessment of extreme events for Prague city **135**

## **Chapter 13**

*J. Červený, T. Zavřel, D. Chmelík, D. Búzová, J. Fedorko, P. Literáková, K. Sukačová, A. Segečová, T. Roitsch*

Microalgal adaptive biotechnologies for a sustainable future **149**