

Publishing details	2
Editorial board, Contributors, Acknowledgements and Image and graphics credits	3
Preface	5
 CHAPTER I – THE SOIL HABITAT	 8
Scope of the atlas	9
What is soil?	10
Where do soils come from?	11
Soil-forming factors	
Parental material	12
Topography	13
Climate	14
Living organisms	17
Human activities	18
Time	19
Soil-forming processes	20
Map of global distribution of soils	26
 CHAPTER II – DIVERSITY OF SOIL ORGANISMS	 28
Introduction	29
Prokaryota	
Archaea	32
Bacteria	33
Protists	36
Fungi	
Macrofungi	38
Mycorrhizal fungi	40
Other fungi	41
Photosynthesisers	
Lichens	42
Plants	43
Microfauna	
Tardigrada	44
Rotifera	45
Nematoda	46
Mesofauna	
Enchytraeidae	48
Acari	49
Collembola	50
Protura	51
Diplura	52
Pseudoscorpiones	53
Macrofauna	
Formicidae	54
Termites	55
Isopoda	56
Myriapoda	57
Earthworms	58
Coleoptera	59
Soil insect larvae	60
Ground- and litter-dwelling macrofauna	61
Mega fauna	
Mammalia, Reptilia and Amphibia	62
Methods to study soil biodiversity	64
 CHAPTER III – GEOGRAPHICAL AND TEMPORAL DISTRIBUTION	 66
Introduction	67
Distribution patterns	
Biogeography	68
Distribution of soil organisms	69
Soil biodiversity at aggregate scale	72
Soil biodiversity at the extremes	73
Soil biodiversity over time	74
Soil biodiversity and ecoregions	
Map of distribution across ecoregions	76
Tropical and subtropical forest	78
Temperate and boreal coniferous forest	79
Temperate broadleaf and mixed forest	80
Temperate grassland	81
Tropical and subtropical grassland	82
Mediterranean forest, woodland and shrubland	83
Montane grassland and shrubland	84
Tundra	85
Antarctica	86
Desert and dry shrubland	87
Anthropogenic ecosystems	
Agroecosystem	88
Urban ecosystem	89
Map of global distribution of soil biodiversity	90
 CHAPTER IV – ECOSYSTEM FUNCTIONS AND SERVICES	 92
Introduction	93
Provisioning services	
Production of food and fibre	98
Biotechnology	100
Regulating services	
Atmospheric composition and climate regulation	102
Water supply and quality	107
Biological population control	108
Supporting services	
Soil formation and maintenance	110
Cultural services	
Natural capital	114

CHAPTER V – THREATS

Introduction	117	Overgrazing	124
Loss of aboveground biodiversity	118	Fire	126
Introduction of invasive species	119	Soil erosion	128
Pollution	120	Land degradation and desertification	130
Acid rain and nutrient overloading	121	Climate change	132
Agricultural practices	122	Map of potential threats to soil biodiversity	134

CHAPTER VI – INTERVENTIONS

Introduction	137	Agroforestry, afforestation and reforestation	144
Land sparing versus land sharing	138	No-till farming	146
Prevention and restoration of invaded sites	140	Fire management	148
Bioremediation	141	Soil erosion control	149
Diversification of cropland	142	Soil amendments	150

CHAPTER VII – POLICY, EDUCATION AND OUTREACH

Introduction	153	Knowledge sharing	160
Policies for soil biodiversity	154	Education and awareness	162
Historical knowledge	156	Resources	164
Research into soil biodiversity	158		

CHAPTER VIII – CONCLUSIONS

Global Soil Biodiversity Initiative	166
Global Soil Biodiversity Assessment	167
Conclusions	168

ADDITIONAL INFORMATION

Glossary	170
Bibliography	172
Contacts	174
European Commission's Joint Research Centre	175
JRC Soil Atlas Series	176