

CONTENTS	5.3.1 Sediment management in agriculture	11
TP	5.3.2 Site management in forestry	15
BA	5.3.3 Management of water bodies	15
12	5.3.4 Soil protection methods	15
	nottingham do the environment in case of ESR	15
Preface	5.4 Technology	13
Chapter 1	Soil conservation (J. Filip)	15
10	1.1 Soil conservation and the danger of erosion	16
OT	1.2 Conservation of farm and forest land	22
18	-notni polozne no vlastnosti zeminy v podlosti podzemna	22
Chapter 2	Erosion of the Soil (J. Dvořák)	25
18	2.1 The types of erosion	25
18	2.1.1 Water erosion	25
18	2.1.2 Wind erosion	28
18	2.1.3 Glacial erosion	29
18	2.1.4 Snow erosion	29
18	2.1.5 Ground erosion	29
18	2.2 Manifestations of erosion	30
18	2.2.1 Manifestations of water erosion	30
18	2.2.1.1 Areal water erosion	30
18	2.2.1.2 Scouring erosion	33
18	2.2.1.3 Stream erosion	35
18	2.2.2 Manifestations of wind erosion	36
18	2.2.2.1 Deflation	36
18	2.2.2.2 Corrasion	36
18	2.3 Erosion intensity	37
18	2.3.1 Normal erosion	37
18	2.3.2 Accelerated erosion	37
18	2.3.3 Admissible intensity of erosion	37
18	-notni polozne no vlastnosti zeminy v podlosti podzemna	37
Chapter 3	Erosion Factors (J. Antal)	39
201	3.1 Definition of erosion factors	39
201	3.1.1 Climatic conditions of the territory	39
201	3.1.2 Hydrological conditions in the territory	41
201	3.1.3 The topography of the territory	42
201	3.1.4 Soil conditions in the territory	45
201	3.1.5 Geological conditions in the territory	45
201	3.1.6 Vegetation in the territory	45
201	3.1.7 The economic and technical conditions in the territory	46
201	3.1.8 The socio-economic conditions	47

3.2 Evaluation of erosion factors	47
3.2.1 Runoff of precipitation water	47
3.2.1.1 Characteristics of design rain	48
3.2.1.2 Infiltration capacity of the soil	51
3.2.1.3 The rise of surface runoff of precipitation water	53
3.2.1.4 Characteristics of surface runoff	55
3.2.2 Erosion potential of water and wind	67
3.2.3 Erodibility of the soil	70
3.2.4 The effect of other erosion factors on erosion intensity	72
3.2.4.1 The effect of topographic conditions on soil erosion	72
3.2.4.2 The effect of vegetation on soil erosion	75
3.2.4.3 The effect of economic and technical conditions on soil erosion	77
Chapter 4 Analysis of Erosion (<i>J. Dvořák</i>)	81
4.1 Regularities of water erosion	81
4.1.1 Velocity of areal runoff	81
4.1.2 Tangential stress in areal runoff	84
4.1.3 Admissible slope length	84
4.2 Regularities of wind erosion (<i>M. Pasák</i>)	89
4.3 Modelling erosion processes (<i>F. Křovák</i>)	94
4.3.1 Wischmeir and Smith's empiric model of the erosion processes	94
4.3.2 Mathematical models of erosion processes	99
Chapter 5 Erosion Control to Protect the Soil	101
5.1 Anti-erosion site organisation (<i>J. Antal</i>)	102
5.1.1 Delimitation of the land fund	102
5.1.2 Woodland, grassland and cropland: distribution and location	105
5.1.3 The shape, size and position of fields	106
5.1.4 The communications network	109
5.2 Cultural operations for erosion control (<i>J. Antal</i>)	111
5.2.1 Contour cultivation	111
5.2.2 Furrowing	113
5.2.3 Cultural practices for erosion control	115
5.3 Biological measures for erosion control (<i>J. Antal</i>)	118

5.3.1	Soil conservation, rotation of crops	118
5.3.2	Strip cropping	118
5.3.3	Antierosion grassing	124
5.3.4	Forest shelter belts	124
5.3.5	Conservation afforestation	124
5.4	Technical measures of erosion control (<i>J. Filip</i>)	125
5.4.1	Terrain regulation	125
5.4.2	Terrace channels	126
5.4.3	Ditches	130
5.4.4	Check dams	134
5.4.5	Terraces	136
5.4.6	Erosion control reservoirs	143
Chapter 6	Torrent Control (<i>L. Novák</i>)	148
6.1	Torrent characteristics	148
6.2	Sediments	153
6.2.1	Properties of sediment grains	153
6.2.1.1	Sediment grain size	153
6.2.1.2	Sediment grain density and mass	154
6.2.1.3	Sediment grain shape	155
6.2.2	Properties of sediment mixtures	158
6.2.2.1	Location of sediment grains in the mix	158
6.2.2.2	Sediment mix composition	159
6.2.2.2.1	Sediment sampling	160
6.2.2.2.2	Sediment sample analysis and interpretation	161
6.2.3	Incipient sediment movement	166
6.2.3.1	The critical bed velocity method	167
6.2.3.2	The critical average channel velocity method	171
6.2.3.3	The critical shear stress method	172
6.2.4	Movement of sediment material	173
6.2.4.1	Bed load discharge	173
6.2.4.2	Sediment runoff	178
6.3	Principles of torrent control	182
6.3.1	Extent of torrent management	182
6.3.2	Methods of torrent control	183
6.3.2.1	Design discharge	183
6.3.2.2	Realignment	185
6.3.2.3	Adjustment of the bed slope	189
6.3.2.4	Designing the channel cross section	198

8II	6.3.2.5 Channel lining	205
8II	6.3.2.5.1 Bottom lining structures	206
ASI	6.3.2.5.2 Structures to line channel slopes	208
ASI	6.3.2.6 Structures for torrent control	224
Chapter 7	Gully Control (L. Novák)	290
	7.1 Gully erosion	290
	7.2 Causes of gully erosion	290
	7.2.1 Climatic conditions	291
	7.2.2 Geomorphology	291
	7.2.3 The soil and geological conditions	291
	7.2.4 Vegetation	291
	7.3 Gully forms	291
	7.4 Gully stabilisation	293
	7.4.1 Headcut control	294
	7.4.2 Protecting the gully bottom	295
	7.4.3 Securing the gully side slopes	296
	7.5 Stabilisation of aged gully formations	298
Chapter 8	Management of Land Endangered by Slippage (D. Húška)	301
	8.1 Causes of slope failure	301
	8.1.1 Movement of surface deposits down the slope	305
	8.1.2 Stratified landslides	306
	8.1.3 Liquefied earth	306
	8.1.4 Liquid deposits	307
	8.1.5 Landslides caused by sand washing	307
	8.2 Methods of control and management of areas exposed to the danger of landslide	308
	8.2.1 Field investigations	308
	8.2.2 Interpreting the results of investigation	310
	8.2.3 Securing the landslide territory	311
	8.2.4 Special structural approaches to landslide stabilisation	315
Chapter 9	Vegetation in the Landscape	318
	9.1 Forests in landscape (J. Stredánský)	318
	9.1.1 Functions of forests	320
	9.1.1.1 Water management function	320
	9.1.1.2 Microclimatic and hygienic functions of forest	322
	9.1.1.3 Soil-improvement function	323

9.1.1.4 Soil-conservation function	323
9.1.1.5 Recreational function	323
9.2 Fundamentals of the formation of vegetation (<i>J. Stredanský</i>)	323
9.2.1 Forest nursery practice	323
9.2.1.1 Seedling production	324
9.2.1.2 Production of plants	325
9.2.2 Afforestation	327
9.2.2.1 Soil preparation	327
9.2.2.2 Afforestation techniques	329
9.2.3 Treatment and protection of cultures	336
9.2.4 Filling the gaps and improving the stands	337
9.3 Tending of stands (<i>J. Stredanský</i>)	337
9.3.1 Techniques of forest stand tending	338
9.3.1.1 Tending of new growths and young crops	338
9.3.1.2 Tending of thickets	339
9.3.1.3 Tending of stands in small-pole and pole stages	339
9.3.1.4 Silvicultural treatment of maturing stands	340
9.4 Soil-conservation forest stands (<i>J. Stredanský</i>)	340
9.4.1 Grassing	341
9.4.2 Soil-conservation afforestation	342
9.4.2.1 Soil preparation	342
9.4.2.2 Choosing the species and the method of soil conservation afforestation	347
9.5 Riparian stands (<i>L. Novák</i>)	349
9.5.1 Riparian stands along water courses	349
9.5.1.1 Mission of riparian stands along water courses	349
9.5.1.2 Effect of riparian stands on the flow rate in a channel	351
9.5.1.3 Species composition of riparian stands	357
9.5.1.4 Spatial structure of riparian stands	360
9.5.1.5 Formation of riparian stands	364
9.5.1.6 Maintenance and regeneration of riparian stands	369
9.5.2 Riparian stands by reservoirs	371
9.5.2.1 Using riparian stands to protect the banks of water reservoirs	372
9.6 Forest shelter belts (<i>L. Novák</i>)	378
9.6.1 Windbreaks	378

9.6.1.1	The favourable effect of windbreaks	378
9.6.1.2	The adverse effect of windbreaks	382
9.6.1.3	Formation of windbreaks	382
9.6.2	Infiltration belts	384
References	389
Subject Index	395