

# Contents

	<i>Preface</i>	<i>page</i>	ix
1	Introduction	1	
1.1	The subject matter: definition, history, study methods	1	
1.2	Portrayal of groundwater flow systems	8	
2	The ‘Unit Basin’	26	
2.1	The basic flow pattern	26	
2.2	Basic patterns of fluid-dynamic parameters	29	
3	Flow patterns in composite and heterogeneous basins	33	
3.1	Effects of basin geometry	33	
3.2	Effects of basin geology	50	
3.3	Effects of temporal changes in the water table: transient pore pressures and flow systems	71	
3.4	Hydraulic continuity: principle and concept	81	
4	Gravity flow of groundwater: a geologic agent	91	
4.1	Introduction	91	
4.2	The basic causes	93	
4.3	The main processes	97	
4.4	Manifestations	102	
4.5	Summary	126	
5	Practical applications: case studies and histories	128	
5.1	Characterization and portrayal of regional hydrogeologic conditions	129	
5.2	Effects of recharge–discharge area characteristics on groundwater-related practical problems	143	
5.3	Site-selection for repositories of high-level nuclear-fuel waste: examples for groundwater flow-system studies	188	
5.4	Interpretation and utilization of observed deviations from theoretical patterns of gravity-driven groundwater flow	206	

5.5	Exploration for petroleum and metallic minerals	225
5.6	Potential role of flow-system analysis in surface geochemical prospecting	231
6	Epilogue: gravitational systems of groundwater flow and the science of hydrogeology	244
	<i>Glossary</i>	248
	<i>References</i>	259
	<i>Appendices</i>	274
	<i>Appendix A</i>	275
	<i>Appendix B</i>	281
	<i>Index</i>	294