

Chapters and sub-sections

1 Rocks, dissolution and karst

Limestone lithologies
Limestone and dissolution
Karst landforms developed by dissolution
Climatic influence on limestone karst
Dolomite and its sinkholes
Chalk and its sinkholes
Evaporite rocks and their sinkholes
Man's influence on sinkholes

2 Sinkhole classification

Sinkholes and dolines
Classification of sinkholes
Solution sinkholes and solution dolines
Collapse and caprock sinkholes
Subsidence, suffusion and dropout sinkholes
Buried sinkholes
Karst types and sinkhole distribution

3 Rock failure in collapse sinkholes

Karstic collapse
Collapse of cave chambers
Collapse sinkholes
Caprock sinkholes
Breccia pipes
The collapse geohazard

4 Soil failure in subsidence sinkholes

Subsidence sinkhole morphology
Types of subsidence sinkholes
Dropout sinkholes
Distribution of subsidence sinkholes
The subsidence sinkhole geohazard

5 Buried sinkholes and rockhead

Buried sinkhole morphology
Buried sinkholes as engineering hazards
Buried sinkholes and soil pipes in chalk

6 Sinkholes in insoluble rocks

Lava tubes
Sinkholes in other forms of pseudokarst

7 Rock failure under load over caves

Collapse sinkholes induced by loading
Bearing capacity of cave roofs
Safe cover thickness over caves
Existing structures over caves

8 Sinkholes induced by engineering

Sinkholes induced by increased water input
Sinkholes induced by water table decline
Sinkholes induced by ground disturbance
Avoidable geohazard of induced sinkholes

9 Ground investigation

Preliminary stages
Ground investigation fieldwork
Ground-based geophysical surveys
Airborne and satellite remote sensing
Direct investigations

10 Hazard and risk assessment

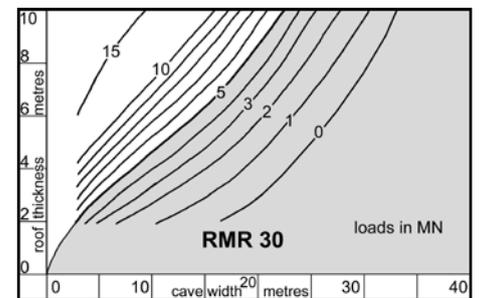
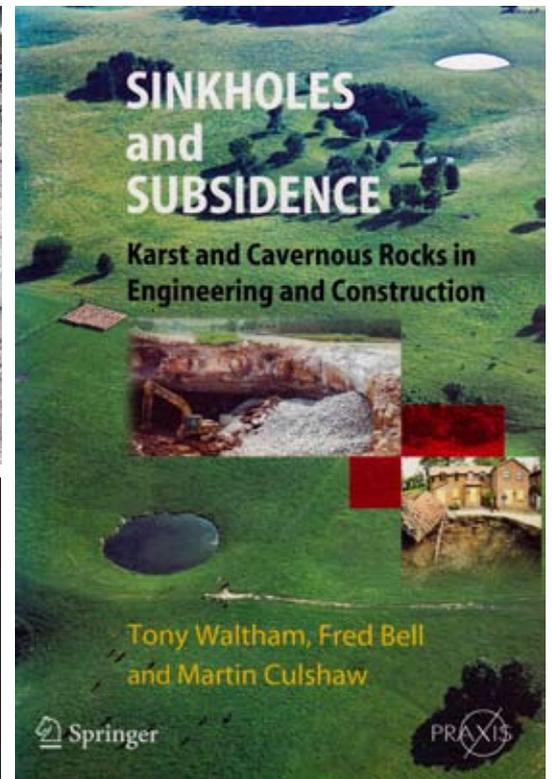
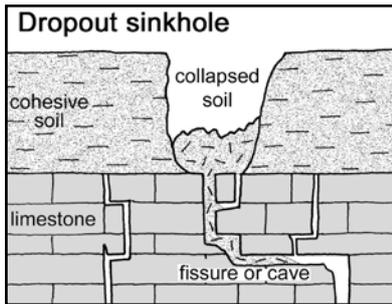
Hazard and risk
Risk management
Karst hazard analysis
Hazard maps and land-use planning
Legislation related to sinkhole hazards
Sinkholes and insurance

11 Prevention and remediation

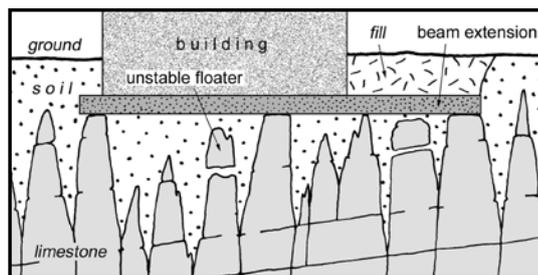
Soil treatment as sinkhole prevention
Sinkhole remediation
Landfills in sinkhole karst

12 Construction in sinkhole terrains

Construction on soil over karst
Roads and railways on karst
Foundations on karst bedrock
Tunnels through cavernous ground
Dam construction in sinkhole karst



Sinkholes and Subsidence is a comprehensive and accessible source of information about one of the most difficult types of ground conditions encountered by civil engineers - cavernous karst. Its aim is to provide an understanding of ground cavities, subsurface processes, sinkhole collapses and ground subsidence, thus helping construction engineers to design structures that will stand safely on this type of ground.
Published by Springer / Praxis, 2005, ISBN 3-540-20725-2



The Case Studies

Remediation of a sinkhole over gypsum at Ripon, UK
Collapse sinkhole at Dishman Lane, Bowling Green, Kentucky
Caves and sinkholes in motorway construction, Slovenia
Road built over Sung Gul lava tube, Korea
Prevention of karst collapse for the Shui-Nan Highway, China
Construction over a cave in Huntsville, Alabama
Sinkhole destruction of Corporate Plaza Building, Pennsylvania
Subsidence over a chalk pipe at Chalfont St Peter, UK
Geophysical investigations of sinkholes in chalk, UK
Detection of caves by microgravity geophysics, Bahamas
Sinkholes and subsidence over salt at Wink, Texas
Subsidence over buried karst at Centurion, South Africa
Agriculture on sinkhole karst on gypsum, Lithuania
Sinkhole remediation over Weeks Island salt dome, Louisiana
Hazard assessment on dolomite at Simunye, South Africa
Ground investigation in covered karst near Tournai, Belgium