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Nota di contenuto	1. Dating Past Events on Fans and Cones – An Introduction -- 2. Processes of Sediment Supply to Alluvial Fans and Debris Cones -- 3. Susceptibility and Triggers for Debris Flows: Emergence, Loading, Release and Entrainment -- 4. Sediment Transport Processes -- 5. Debris-Flow Runout and Deposition on the Fan -- 6. Events on Fans and Cones: Recurrence Interval and Magnitude -- 7. Silent Witnesses For Torrential Processes -- 8. Assessment of Past Torrential Events Through Historical Sources -- 9. The Use of Airborne Laser Swath Mapping on Fans And Cones: An Example from the Colorado Front Range -- 10. Dendrogeomorphology – Tracking Past Events with Tree Rings -- 11. Tree-Ring Based Record of Debris-Flow Dynamics and Triggering Rain Storms at Ritigraben (Swiss Alps) Since AD 1570 -- 12. Vegetation Analysis on Composite Debris Cones -- 13. Using Age of Colonizing Douglas-Fir for the Dating of Young Geomorphic Surfaces – A Case Study -- 14. Lichenometric Dating of Debris Avalanche Deposits with an Example from the French Alps -- 15. Lake Sediments as

Archives of Recurrence Rates and Intensities of Past Flood Events -- 16. Dating Fan Deposits with Cosmogenic Nuclides -- 17. Radiocarbon Dating: Alluvial Fan / Debris Cone Evolution and Hazards -- 18. Luminescence Dating of Alluvial Fans and Cones -- 19. Timing The Interface Between Mass Wasting and Fluvial Processes with OSL -- 20. Debris-Flow Monitoring in Italy -- 21. Documentation of Torrential Events -- 22. Rainfall Thresholds for Possible Occurrence of Shallow Landslides and Debris Flows in Italy -- 23. Hazard Assessment -- 24. Dealing With Natural Hazard Risks In Switzerland – The Influence Of Hazard Mapping On Risk-Based Decision Making -- 25. Hazard Mapping and Land-Use Planning – A Swiss Perspective -- 26. Design Criteria for Torrential Barriers -- 27. Forecasting, Early Warning and Event Management: Non-Structural Protection Measures for Flash Floods and Debris Flows -- 28. Climate Research and Adaptation Strategies – Examples from the European Alps -- 29. Dating Methods Overview: Checklist for Practitioners -- 30. Summary and Outlook.

Sommario/riassunto

Water-related processes such as floods, debris floods, flash floods, and debris flows represent major geomorphic hazards in mountain areas of the world. Recent decades have seen human pressures on these regions increase, aggravating conflicts between natural hazards and infrastructure. Detailed knowledge on frequency and magnitude of past flood or debris-flow events on alluvial fans and cones remains scarce, although it is widely accepted that such knowledge is of crucial importance for the assessment of hazards, mitigation of risks, and land-use planning. Archival records on the occurrence of past events are often fragmentary or even completely missing. Modern methods of historical dating of past debris-flow and flood events such as dendrochronology, radiocarbon dating, lichenometry and many more can provide valuable insights into past process activity and thus add key detail to the historical record. This book provides a detailed overview on methods used for the dating of past torrential activity on fans and cones and fosters the discussion on the impact of past and potential future climate change on torrential processes. The book has a clear focus on the practical applications of these methods, complemented by case studies. The limits of each dating method in case of excessive natural and human interventions on fans and cones are shown.